THE

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TO READERS AND CORRESPONDENTS.

All communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of November.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

We must again ask the indulgence of our contributors. Although sixteen pages have been added to the present number, we have been compelled, by want of space, to postpone the publication of several communications, some of which are actually in type.

The following works have been received:—

Ueber den von Hammond Athetose genannten Symptomencomplex. Von Dr. Martin Bernhardt, Privatdocenten zu Berlin.

Syphilis. Von Christian Bäumler, M.D.

Della Bilharzia Hæmatobia. Dal Dott Prosperino Sonsino. Firenze, 1876.

Chirurgie Antiseptique Principes, modes d'Application et Résultats du Pansement de Lister. Par le Dr. Just Lucas-Championnière, Chirurgien des Hôpitaux. Paris: J. B Baillière et Fils, 1876.

Memoires sur la Galvanocaustique Thermique par le Docteur A. Amussat, Fils. Paris: Germer Baillière, 1876.

Des Sondes a Demeure et du Conducteur en Baleine. Par le Docteur A. Amussat.

De l'Exstrophie de la Vessie envisagée spécialement au point de vue du Traitement Chirurgical. Thèse pour le Doctorat en Médecine présentée et soutenue par Rodolfo Valdivieso, Ancien Interne des Hôpitaux de Philadelphie. Paris: A. Parent, 1876.

Catalogue of the Models of Diseases of the Skin in the Museum of Guy's Hospital. By C. Hilton Fagge, M.D, Curator, etc. London: J. & A. Churchill, 1876.

The Liverpool and Manchester Medical and Surgical Reports, 1876. Manchester: J. E. Cornish, 1876.

On Port-Wine-Mark and its Obliteration without Scar. By Balmanno Squire, M.B. Lond. London: J & A. Churchill, 1876.

On Secondary Hemorrhage, owing to Ulceration of the Popliteal Artery by a Sequestrum. By Edward W. Collins, M.D. Dublin, 1876.

Report of the Foochow Medical Missionary Hospital in connection with the A. B. C. F. M. Mission, June 1, 1876.

The Arrow Poison of the Ainos. By Stuart Eldridge, M.D., late Surgeon-in-Chief, Northern District of Japan. Yokohama.

Constitution, By-Laws, and Code of Ethics of the Medical Society of Yokohama, Japan. Yokohama, 1876.

A Practical Treatise on Diseases of the Eye. By Robert Brudenell Carter, F.R.C.S., Ophthalmic Surgeon to St. George's Hospital, etc. Edited, with Additions and Test-Types, by John Green, M.D. Philadelphia: Henry C. Lea, 1876.

A Manual of Percussion and Auscultation; of the Physical Diagnosis of Diseases of the Lungs and Heart, and of Thoracic Aneurism. By Austin Flint, M.D., Prof. of Principles and Practice of Medicine and of Clinical Med., in Bellevue Hospital Medical Coll., etc. Philadelphia: Henry C. Lea, 1876.

A Treatise on the Science and Practice of Midwifery. By W. S. Playfair, M.D., F.R.C.P., Prof. of Obstetric Med. in King's College, etc. Philadelphia: Henry C. Lea, 1876.

A Practical Treatise on the Diseases, Injuries, and Malformations of the Urinary Bladder, the Prostate Gland, and the Urethra. By SAMUEL D. GROSS, M.D., LL.D., D.C.L. Oxon., Prof. of Surgery in the Jefferson Med. Coll. of Phila. Third edition, revised and edited by Samuel W. Gross, A.M., M.D., Surgeon to the Philadelphia Hospital. Philadelphia: Henry C. Lea, 1876.

Illustrations of Clinical Surgery. By JONATHAN HUTCHINSON, F.R.C.S. Fasciculus IV. Philadelphia: Lindsay & Blakiston, 1876.

A Manual of Midwifery. By ALFRED MEADOWS, M.D. Lond., F.R.C.P., Physician Accoucheur to St. Mary's Hospital. 2d American from 3d London edition, revised and enlarged. Philadelphia: Lindsay & Blakiston, 1876.

The Theory and Practice of Medicine. By FREDERICK T. ROBERTS, M.D., Assist. Phys. and Assist. Teacher of Clin. Med. at Univ. Coll. Hosp. Second Am. from last London edition, revised and enlarged. Philadelphia: Lindsay & Blakiston, 1876.

On Tracheotomy, especially in relation to Diseases of the Larynx and Trachea. By W. PUGIN THORNTON, Surgeon to Hospital for Diseases of Throat. Philadelphia: Lindsay & Blakiston, 1876.

Studies, Chiefly Clinical, in the Non-Emetic Use of Ipecacuanha. With a Contribution to the Therapeusis of Cholera. By ALFRED A. WOODHULL, M.D., Assist. Surgeon U. S. A. Philadelphia: J. B. Lippincott & Co., 1876.

Cyclopædia of the Practice of Medicine. Edited by Dr. H. VON ZIEMSSEN. Vol. XI. Diseases of the Peripheral Cerebro-Spinal Nerves. By Prof. WILHELM HEINRICH ERB, of Heidelberg. Translated by Mr. Henry Power, of London. Albert H. Buck, M.D., New York, editor of Am. ed. New York: William Wood & Co., 1876.

What is the Best Treatment in Contracted Pelves? By ISAAC E. TAYLOR, M.D. New York, 1876.

A Practical Treatise on Materia Medica and Therapeutics. By ROBERTS BARTHOLOW, M.A., M.D., Prof. of Theory and Prac. of Med. and of Clin. Med. in Med. Coll. of Ohio, etc. New York: D. Appleton & Co., 1876.

Hay Fever, or Summer Catarrh; its Nature and Treatment. By GEORGE M. BEARD, A.M., M.D. New York: Harper & Brothers, 1876.

A Contribution to the Treatment of Uterine Versions and Flexions. By EPHRAIM CUTTER, M.D. Second edition, entirely rewritten. Boston: Jas. Campbell, 1876.

Micro-Photographs in Histology. By CARL SEILER, M.D., in conjunction with J. Gibbons Hunt, M.D., and Joseph G. Richardson, M.D., Nos. 1, 2, 4. Philadelphia: J. H. Coates & Co., 1876.

A Contribution to the Study of the Transmission of Syphilis. By R. W. TAYLOR, M.D. New York, 1876.

Yellow Fever and Malarial Diseases. By GREENSVILLE DOWELL, M.D. Philadelphia, 1876.

Specialists and Specialties in Medicine. By M. H. HENRY, M.D. N. Y., 1876.

Vaccination as a Preventive of Smallpox. By W. C. CHAPMAN, M.D. Toledo, 1876.

Sulphate of Cinchonidia. By J. W. COMPTON, M.D. Paducah, Ky., 1876.

The Gathering, Packing, Transportation, and Sale of Fish, Vegetables, and Fruits. By SAMUEL C. BUSEY, M.D. Cambridge, 1876.

Mania Transitoria. By EUGENE GRISSOM, M.D. Raleigh, 1876.

The Forceps in Breech Deliveries, with a Description of a New Instrument. By A. J. MILES, M.D. Cincinnati, 1876.

Laws of the State of Michigan relating to the Public Health. Lansing, 1876.

Constitution and By-Laws of the New York Academy of Medicine. August, 1876. New York, 1876.

Remarks on Intra-Uterine Polypi. By A. REEVES JACKSON, M.D. Chicago, 1876.

Report on the Ventilation of the House of Rrepresentatives and of the South Wing of the Capitol of the United States. By ROBERT BRIGGS, C. E., Philadelphia. Philadelphia, 1876.

A Sketch of the Life and Writings of Louyse Bourgeois, Midwife to Marie de Medici, the Queen of Henry IV. of France. By WILLIAM GOODELL, A.M., M.D. Philadelphia, 1876.

Report on the Registration of Prevalent Diseases. By F. W. DRAPER, M.D., of Boston. Boston, 1876.

The Cause of Rotation in Lateral Curvature of the Spine. By A. B. JUDSON, A.M. M.D. New York, 1876.

Thirty-seven Operations of Thoracentesis by Pneumatic Aspiration. By FRANK DONALDSON, M.D. Baltimore, 1876.

On the successful Treatment of some Forms of Peripheral Paralysis. By JOHN VAN BIBBER, M.D. Baltimore, 1876.

Analysis of 600 Cases of Skin Disease, with Cases and Remarks on Treatment. By L. DUNCAN BULKLEY, M.D. New York, 1876.

On some Disputed Points in Physiological Optics. By HENRY HARTSHORNE.

An Analysis of a few Cases of Abdominal Disease. By W. C. VAN BIBBER, M.D. Baltimore, 1876.

Gastrotomy and Gastrostomy. By J. H. POOLEY, M.D., Prof. of Surgery, Starling Med. Coll., Columbus, Ohio. Columbus, 1876.

Neurotic Purpura. By GERRARD G. TYRRELL. San Francisco, 1876.

Orthopedic Surgery; Deformities of the Lower Extremities. By VAN S. LINDSLEY, M.D.

The Climatotherapy of, and the American Mountain Sanitarium for Consumption. By STANFORD E. CHAILLÉ, M.D. Baltimore, 1876.

Western North Carolina as a Health Resort. By W. GLEITSMANN, M.D. Baltimore, 1876.

On a New Apparatus for Fractures of the Leg. By OSCAR J. COSKEY.

A Plea for Principles and Conservatism in the Treatment of Diseases Peculiar to Females, embracing the Report of a Case of Superinduced Pseudo-cyesis, with results. By WM. ABRAM LOVE, M.D. Atlanta, 1876.

Medical Schools and their Relations to the Profession. By JOEL W. SMITH, M.D. Charles City, 1876.

Some Points on the Pathology and Treatment of Cholera Infantum. By EDWARD WALDO EMERSON, M.D., of Concord, Massachusetts.

Report on Medical Education made to Med. Society of California. By JOS. F. MONTGOMERY, M.D. Sacramento, 1876.

On Abscesses in the Lower Abdominal Cavity and its Parietes. By GURDON BUCK, M.D. New York, 1876.

Two Cases of Ovariotomy. By R. A. KINLOCH, M.D.

The Spectroscope, its Value in Medical Science. By GEORGE R. FOWLER, M.D. New York, 1876.

The Collateral Circulation in Aneurism. Report of the Successful Ligation of the Innominate, the Common Carotid, the Vertebral, and the Internal Mammary Arteries in a case of Right Subclavian Aneurism. By A. W. SMYTH, M.D., House Surgeon Charity Hospital. New Orleans, 1876.

Report on Vaccination. By Wm. B. DAVIS, M.D. Cincinnati, 1876.

On Stricture of the Male Urethra, its Radical Cure. By FESSENDEN N. OTIS, M.D. New York, 1875.

A Clinical Lecture on the Use of Plastic Dressing in Fractures of Lower Extremity. By D. W. YANDELL, M.D. Indianapolis, 1876.

A Clinical Lecture on the Treatment of Incipient Stricture by Otis's Operation. By Mr. BERKELEY HILL, Prof. of Clin. Surg. in Univ. Coll., London. Together with Explanatory Remarks on the Treatment of Stricture and Gleet. By FESSENDEN N. OTIS, M.D.

Chorea; its Cause and Treatment. By GEORGE T. STEVENS, M.D. Albany, New York, 1876.

An Address on some of the Leading Public Health Questions; with Remarks on the Extent of Swamp Lands in the United States, and their Reclamation as a Sanitary and Economic Measure. By J. M. TONER, M.D. Cambridge, 1876.

Transactions of Medico-Chirurgical Faculty of Maryland, 1876. Baltimore, 1876.

Proceedings of the Connecticut Medical Society, New Haven, May 1876.

Transactions of the South Carolina Medical Association. Annual Session, 1876.

Transactions of Medical Association of State of Missouri, 1876. St. Louis, 1876.

Transactions of the Medical Association of the State of Alabama. Session 1876.

Transactions of the Medical Society of New Jersey, 1876.

Transactions of Medical Society of California, 1875–6. Sacramento, 1876.

Transactions of New York Academy of Medicine. Second Series, Vol. II. New York, 1876.

Transactions of the College of Physicians of Philadelphia. Third Series, Vol. the Second. Philadelphia, 1876.

Proceedings of the New York Academy of Medicine, May 20, 1875.

Proceedings of the Medical Society of the County of Kings, Brooklyn, New York. July, August, September, 1876.

Proceedings of Academy of Natural Sciences of Phila. January to May, 1876.

Michigan State Medical Society. Address of the President, Dr. WM. BRODIE, Detroit.

Address by Prof. COLLIER, Burlington, 1876.

Address by J. W. SINGLETON, M.D., of Paducah. Louisville, 1876.

Report of the State Lunatic Asylum. Utica, N. Y., 1875. Albany, 1876.
Report of the Board of Health of the City of Boston, 1876. Boston.

The following Journals have been received in exchange:—

Deutsches Archiv für Klinische Medicin. Bd. XVIII., Heft 1.
Archiv der Heilkunde, Bd. XVII. Heft 5.
Archiv für Anatomie, Physiologie und Wissenschaftliche Medicin, 1876. Nos. 1, 2.
Centralblatt für die Medicinische Wissenschaften. Nos. 22 to 36. 1876.
Allgemeine Wiener Medizinische Zeitung. Nos. 23 to 35. 1876.
Deutsche Medicinische Wochenschrift. Nos. 21 to 35. 1876.
Nordiskt Medicinskt Arkiv. Bd. VIII., Heft 1.
Bibliothek for Læger. VI., 3.
Upsala Läkareförenings Förhandlingar. Bd. XI., Nos. 6, 7, 8.
Annali Universali di Medicina e Chirurgia. Maggio, 1876.
L'Imparziale. Nos. 12 to 17. 1876.
Lo Sperimentale. Nov. 1875. Febbraio to Augusto.
O Correio Medico de Lisboa. Nos. 13 to 28. 1876.
Archives Générales de Médecine. July, Aug., Sept., 1876.
Annales de Dermatologie et de Syphilographie. Tome VII. Nos. 4, 5. 1876.
Annales des Maladies de l'Oreille et du Larynx. Juillet, 1876.
Revue des Sciences Médicales en France et a l'Etranger. Juillet, 1876.
Gazette Hebdomadaire de Médecine et de Chirurgie. Nos. 24 to 35. 1876.
L'Union Médicale. Nos. 69 to 107. 1876.
Le Progrès Médical. Nos. 24 to 36. 1876.
Le Mouvement Médical. Nos. 24 to 36. 1876.
Revue Scientifique de la France et de l'Etranger, Nos. 50 to 52, 1875, and Nos. 1 to 11, 1876.
L'Année Médicale, Nos 7, 8, 9. 1876.
The Retrospect of Medicine. January to June, 1876.
The British and Foreign Medico-Chirurgical Review, July, 1876.
The Lancet. July, August, September, 1876.
The Medical Times and Gazette. July, August, September, 1876.
The British Medical Journal. July, August, September, 1876.
The London Medical Record. July, August, September, 1876.
The Sanitary Record. July, August, September. 1876.
The Practitioner. July, August, September, 1876.
The Royal London Ophthalmic Hospital Reports. May, 1876.
The Obstetrical Journal of Great Britain and Ireland. July, Aug., Sept., 1876.
The Journal of Anatomy and Physiology. April, July, 1876.
Edinburgh Medical Journal. July, August, September, 1876.
The Glasgow Medical Journal. July, 1876.
The Dublin Journal of Medical Science. July, August, September, 1876.
The Indian Medical Gazette. June, July, August, 1876.
The Australian Medical Journal. April, 1876.
Canada Medical and Surgical Journal. July, August, September, 1876.
The Canada Medical Record. June, July, August, 1876
The Canadian Journal of Medical Science. July, August, September, 1876.
The Canada Lancet. July, August, September, 1876.
L'Union Médicale du Canada. Mai, Juin, Juillet, 1876.

The usual American exchanges have been received; their individual acknowledgment we are compelled to omit for want of space.

Communications intended for publication, and books for review, should be sent *free of expense*, directed to ISAAC HAYS, M.D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Mr. Charles J. Skeet, Bookseller, No. 10 King William Street, Charing Cross, *London*, will reach us safely and without delay.

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The advertisement sheet belongs to the business department of the *Journal*, and all communications for it must be made to the publisher.

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XX. The Medical and Surgical History of the War of the Rebellion. Part II., Volume II. Surgical History. Prepared under the direction of Joseph K. Barnes, Surgeon-General United States Army. By George A. Otis, Assistant Surgeon United States Army. First issue. Royal Quarto, pp. xii., 1024, xx. Washington: Government Printing Office, 1876. 481

XXI. Elements of Human Physiology. By D. L. Hermann, Professor of Physiology in the University of Zürich. Translated from the Fifth edition by Arthur Gamgee, M.D., F.R.S., Brackenbury, Professor of Physiology and Histology in the Owens' College, Manchester; Examiner in Physiology in the University of Edinburgh. 8vo. pp. 576. London: Smith, Elder & Co., 1875. 506

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

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XXVIII. Atlas of Skin Diseases. By Louis A. Duhring, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania; Physician to the Dispensary for Skin Diseases, Philadelphia, etc. Part I. Philadelphia: J. B. Lippincott & Co., 1876. 545

XXIX. Medical and Surgical Memoirs; containing Investigations on the Geographical Distribution, Causes, Nature, Relations, and Treatment of Various Diseases, 1855–1876. By Joseph Jones, M.D., Professor of Chemistry and Clinical Medicine, Medical Department University of Louisiana, etc. etc. 8vo. pp. xviii., 820. New Orleans: Printed for the author by Clark & Hofeline, 1876. 546

XXX. A Treatise on the Diseases of the Nervous System. By William A Hammond, M.D., Prof. of Diseases of Mind and Nervous System in Univ. of City of New York, etc. etc. Sixth edition, Rewritten, Enlarged, and Improved. 8vo. pp. 883. New York: D. Appleton & Co., 1876. 548

XXXI. On certain Endemic Skin and other Diseases of India and Hot Climates generally. By Tilbury Fox, M.D., F.R.C.P., Physician to the Department for Skin Diseases in University College Hospital, Author of various works on Skin Diseases, etc. etc., and T. Farquhar, M.D., Surgeon-Major H. M.'s Bengal Medical Service (retired), etc. etc. Including Notes on Pellagra, Clou de Biskra, Caneotica, and Aleppo Evil (with five plates). By H. Vandyke Carter, M.D. Lond., Surgeon-Major H. M.'s Indian Medical Service, etc. (Published under the Sanction of the Secretary of State for India in Council.) 8vo. pp. 288. London: J. & A. Churchill, 1876. 550

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ART. I.—*On Functional Spasms.* By S. WEIR MITCHELL, M.D., Member of the National Academy of Sciences. (With four illustrations.)

I SHOULD scarcely have thought it worth while to recall attention to the obscure subject of functional spasms and its near clinical relatives were it not that, in some of the most annoying and seemingly hopeless cases, I have been able to give so much relief as to enable the sufferer to resume his place among the active. Yet, besides this, some of the forms of spasm which I shall describe under this name are not as yet fully recognized, or are seen so rarely in every-day practice, as to be looked upon as mere curiosities, or as utterly beyond therapeutic help.

Duchenne de Boulogne, in the second edition of his great work on Electro-therapeutics, has given the name of functional spasm to "an affection characterized by pathological contractions, painful or not, but manifested only during the exercise of certain voluntary or instinctive movements."

He gives first the classical illustration of the various forms of writers' cramp, and others in which the biceps and deltoid contracted painfully when the hand was used. Then he refers to the spastic disorders of shoemakers, tailors, etc., and to the case of a fencing master, who had contractions of various muscles when employing them in the habitual acts of his business. A large number of such examples might be cited from this author and from others.

Putting aside these well-known instances, I desire to call attention to a class of cases which, although nearly related to those just mentioned, differ from them in several most important particulars. They consist of three distinct classes:—

First, those in which the functional activity of a muscle or set of muscles gives rise at times to an exaggeration of the motions involved naturally, and sometimes also to more or less spasmodic activity in remoter groups.

Second, those in which the functional action of one group results only in sudden and possibly in prolonged spasmodic acts, tonic or clonic, in remote groups of muscles not implicated in the original movement.

Third, those in which standing or walking occasions general and disorderly motions, affecting the limbs, trunk, and face, and giving rise to a general and uncontrollable spasm without loss of consciousness.

The first group is, to my mind, one of the most curious. The pure instances, that is, those in which a normal motion is liable to become excessive, are rare. Some cases of writers' cramp nearly fulfil the conditions; but here pain or sense of fatigue is often, nay usually, superadded, and the overaction is not merely excess, but involves inco-ordination almost inevitably.

I mean, therefore, that there exists a set of rare cases in which the motor act becomes suddenly exaggerated.

The result may be temporary, as in the following history of a man who came under my care some years ago:—

He was engaged in the manufacture of watches, and had in it some work which required him to be constantly picking up and adjusting tiny screws. When I saw him, he had been thirty years at this labour. His general health was faultless; but within two years he had acquired a strange peculiarity which made it impossible to do any steady work. When I began to question him as to this matter, he said, let me show you, and asked leave to pour out some sugar-coated pills which were in a phial on my table. He then began to pick them up, which he did easily. Then he said, these are too large, and at last took a wooden match and broke it into small bits, which he put on the table. As he picked these up he stopped at the third one, and said, there it is locked at last. I found that the forefinger and thumb were, as he truly said, locked on the morsel of wood. I forced them open with great difficulty, and was surprised to find the spasm stronger than his normal power in the same parts. This locking took place ten or twelve times a day, and was apt to last from ten to thirty minutes. He would succeed usually in pulling out the imprisoned screw with a loop of twine, but its release did not end the spasm, and very often the screw cut his fingers. Of late, the trouble began to show itself in turning the pages of a book, when at times the finger and thumb would close with violence, and the page be torn. He made the interesting observation that the spasm came soon if he put himself in his habitual attitude when at work, but that it was long delayed if he stood when at his labour.

This was the best case I recall of pure spasmodic increase of a normal act. It involved no pain, and only at times caused slight tremor, as extreme muscular exertion is apt to do in many persons. The moment the spasm was over he could at once pick up a screw and continue to work.

This man had a varied experience in treatment, to mention which in detail would be to name almost every potent drug at our disposal. I used several means to lessen the sensitiveness of the skin of the affected fingers, thinking it possible that the beginning of mischief lay there. Afterwards, at his earnest desire, I used various electrical treatment, in which in such cases I have little faith. All alike failed, and the record was much like that of writers' cramp. Nothing but rest aided him, and he finally left the city to reside on a farm in the country.

As we all know, many trades are liable to cramp of the over-used muscles, as in the hammer palsy described by Duchenne. The calf cramp of the turner in wood or metal. These are usually brief and painful. But sometimes they are of the nature of what I may call, as it is a truthfully descriptive phrase, *lock spasm*, a permanent or lasting painless spasm, of which this is a good example:—

A sawyer, æt. about 40, temperate and healthy, was seized at the end of a long, hot day's work with a sudden spasm of the biceps. The saw, drawn back to prepare for the downward motion, was arrested. He ceased work and went home. His wife said he had a "cold stroke," his doctor that he had a heat stroke, but at all events the biceps only gave way during the sleep of the night which followed. After the spasm had returned many times he came to me one morning with an attack in full force. After the first they came back at long intervals, but these soon grew less, and when I saw him the spasms took place once a day, rarely twice, nor could their length be predicted. The arm I saw was locked in the extreme of a spasm so violent that no effort I could make relaxed it, although I made efforts which it seemed to me might endanger the bones. On a second visit I walked with the patient to a grocer's near by, and there got the man to bend over so as to bring the forearm horizontal. Then I attached a scale-pan to the wrist by a broad band, while he stood bent with his other hand on a chair seat. Then I weighted the scale-pan until, after it had held eighty pounds for five minutes, the arm began to extend, and at last suddenly gave way. This spasm did not return on removal of the weight, but I got no permanent therapeutic use out of the suggestion this gave me. The enormous amount of force generated to sustain eighty pounds at the end of a lever as disadvantageously situated in regard to its fulcrum and to its active mover as the forearm is in relation to its joint and to the biceps, suggests some interesting reflections. Yet the power here wasted is slight as compared with that evolved to sustain the years of spasm in some cases of hysteria.

In the case I have briefly related, I think that good was done by the use of the induction current; one pole was put on the outside of the biceps below and one on the belly above, and the strongest endurable current was passed through it for two hours once a day, and whenever the spasm took place. After a time I also used hypodermic injections of atropia into the belly of the muscle, a treatment for spasm much employed with my colleagues Drs. Morehouse, Keen, and myself, in 1862, while in charge of the U. S. A. Hospital for Diseases and Injuries of the

Nervous System.[1] The same means are still in frequent use at the Philadelphia Infirmary for Nervous Diseases. These two means were, I think, of value, because the spasms became by degrees less, and after several months ceased; a very unusual result of treatment, if it was a result, in these forms of spasm.

The third case of tonic spasm which I shall place beside those already given must owe what details I can give to my remembrance, as the notes are mislaid.

The sufferer was an officer in rugged health when shot through the forearm and arm at the same moment, and just as he was drawing his sword. He felt a shock, but was more conscious of the fact that he could not release his sword-hilt from his grasp. At last he took hold of the fingers with his left hand, and opened them. This is a not rare incident of arm wounds, and had, I think, no near relation to what followed. The wounds partially divided both the median and musculo-spiral nerves, and he endured many months of torment with causalgia (burning pain) in the palm. At last he got well, and at the close of the war came to me for the trouble I shall now describe. At times when holding anything in the grip of the right hand, he would have a sharp pain where the median divides in the palm, and instantly the flexors would violently close the hand. The spasm would endure for two to ten minutes, and then relax. I have seen his palm cut by the violence with which the nails were driven into it. The initial pain left as the spasm began, and the spasm was not of itself painful. He believed that it was caused by pressure on a tender spot in the palm, but I never could cause it by direct pressure. The median branchings in the palm were certainly tender, and I therefore desired him to use the treatment by repeated blisters, which in the war and since I have found so valuable in many local nerve troubles. He used at least twelve blisters on the palm, with the result of ending, I think, altogether his annoying malady. I heard of him as well a year later.

In this last case there must have been a sensitized nerve region, from which the morbid impulse started. It was really a case of reflex influence, and was sometimes amusing in its consequences, because the victim never knew when the grasp would shut relentlessly on what the hand held.

These cases are, I suspect, excessively rare, as are also those in which a normal muscular act causes remote associated movements. The most familiar case is that of the lifting of a palsied arm during the act of yawning.[2] Histrionic spasm of the face also offers some odd illustrations, as in the case of Miss Inman, given by Marshall Hall. Here voluntary drawing down of the right angle of the mouth caused at once spastic closure of the right eye. This very curious case began with general tonic spasm of the right side of the face. He quotes from a French journal a

[1] Gunshot Wounds and other Injuries of Nerves, 1864, Mitchell, Morehouse, and Keen, p. 154.

[2] This act must have curious influence. I saw last year a case of slight strychnic poisoning, in which the act of yawning suspended the spasms.

still more notable case. It is too briefly described as a ball wound of the left side of the face. The wound healed easily, but whenever afterwards the man used the jaws in any way, to speak, to laugh, to chew, instantly the sublabial muscles passed into a state of violent spasm, producing the most hideous grimaces. The normal action of one muscular group evolved the abnormal response of another.

One of my own cases was as interesting. It belonged to the class of hypercineses, in which the spasms lie chiefly in the range of the spinal accessory and first cervical nerves.

R. L., æt. 45, a plumber, previously in good health, was hurt in Jan. 1862, by the fall of a cake of ice, which struck him on the back of the head and knocked him down. He suffered only from stiffness in the muscles at the back of the neck. This never quite left him, and within three months his head was slowly drawn more and more to the left. Then the convulsions appeared, and at brief intervals he had horrible spasms in the trapezius, sterno-cleido-mastoid, tracheloid, and spinatus muscles. Every minute, at least, the head was jerked backwards and twisted to left, the shoulders drawn up, and a storm of rapid but energetic spasms swept over the facial muscles.

He improved very much while taking gelseminum and bromides in full doses, so that at last the abnormal actions above described became really trifling. I believe they came back the year after, but in the interval he had a form of trouble which was painful to see. Whenever he began to chew food the submental muscles would jerk his mouth open, and so hold it until at last he would push it shut with his hand, and chew a little more before the spasm returned. When ready to swallow, his face presented a picture of terror. He would suddenly muster courage and swallow the contents of his mouth at a gulp. Then instantly the jaw flew open, the head was drawn back and down on the left shoulder, the face was convulsed, sweat broke from his forehead, and the attack was at an end. Sometimes, if he could bolt his food very quickly, he escaped the consequences. In this and the last case the muscles involved are really part of the muscle apparatus for chewing, speaking, etc., but have only a subsidiary part; still they belong, as to their activities, to nerves, other than the facial, and are in this sense remote.

Fig. 1.

I have since seen many cases of this form of spasm, and in nearly all the act of laughing, talking, but, above all, chew-

ing, seems to provoke the return of spasms. In one case the convulsive movement drew the head back, and bowed the spine, and passed off by a spasm of the gastrocnemial groups, so as to jerk him into a squatting posture. (See Fig. 1.)

These are hypercineses in which the spasms, usually active with or without apparent cause, are also brought on or increased by the functional activity of other muscle groups, allied or remote.

I have seen also certain spasmodic cases in which all of the abnormal phenomena were related to the physiological act of walking—I might define them as being exaggerations of walking. I have seen this disorder in various forms.

My first case was a chubby, ruddy little boy, aged six, from Tennessee. I could find neither in his own nor his parents' history any cause for his disease, save that it came on slowly after measles. When asked to walk, he exhibited this strange set of symptoms. The left leg was sound and acted well. As he swung the right forward, and lifted the toes to avoid touching the ground, there was first a sudden spasm of the tibial and peroneal muscles, so that the tip of the foot was jerked up too high. Instantly it seemed to relax, and the foot came down, but, as it touched the ground, and the second physiological act of rising on the ball of the foot began, this became extreme and spasmodic. The lad was lifted abruptly, and, the spasm of the gastrocnemii continuing, the leg was jerked up backwards—a true string-halt. I had never seen this before, and was much interested. While at rest on his back he moved the foot at will without annoyance or spasm, nor could I by a blow, or pressure, or tickling of the sole, cause him to repeat the movement.

In July, 1875, I saw at my clinic a case somewhat like the last, but with some important differences.

A delicate looking girl, æt. 7, with a good family history, and no cause to which I can trace her troubles of locomotion. She began to crawl at two years, and never walked till the fifth year, yet with this slowness to move there seemed to be no arrest of mental or moral development. The mother thought that she was gaining ground. When we stripped her I found that she had all the foot motions perfectly, save that of flexing the feet, which, when they got to a right angle with the leg, could move no further, the tendo Achillis refusing to yield. The other muscles above the knee were in that curious state which we find in some partial palsies in adults, and which Dr. Seguin has admirably described. It is a condition of rigidness which varies in degree in different cases. In this state, if you flex the leg on the thigh, the extensors, which should be passive slowly, and, as it were, reluctantly, yield and resist the flexion. If you extend the leg, the flexors act to resist in like fashion. Whatever motion be made, the opponent muscles contract, and every willed movement becomes tardy and difficult, or, in bad cases, impossible. When an attempt is made at passive motion, the muscles do not resist in jerks, but smoothly and evenly, so that it seems as if you were bending a stiff hinge or a bar of soft metal. In fact, so striking is this analogy, that at my clinic this state has come to be briefly described as the "lead-pipe leg." In the present case it was not extreme in degree. Voluntary movement

in walking curiously exaggerated the gastrocnemial spasm. Every time the foot came down the gastrocnemius muscles contracted violently, and so as to lift the child with a jerk on to the foot then in use. If the walk was rapid she walked continuously in this position. If she moved slowly the gastrocnemius only acted as she rose on the ball of the foot, the natural physiological act becoming excessive.

Here was then a slight but permanent tonic spasm of the calf muscles, yielding easily under ether, with a temporary functional spasm alternating in each leg as she used it in walking. After some reflection, Dr. T. G. Morton cut the tendons of the calf muscles on both feet, and, as a result, the muscles, in place of continuing to contract, relaxed, as the resistance ceased. The tendons were thus lengthened at least two inches, but ample power remained, and the walk was most satisfactorily improved. Fig. 2 represents this child walking rapidly. The upward jerk of the heel pitches the child forward, so that she hurries to overtake, as it were, her centre of gravity; while, also, to aid in preserving her balance, the belly is thrown out and the shoulders thrust back.

Fig. 2.

The next case is yet more curious.

R. C., æt. 17, a long, thin, sallow lad, from New Jersey, was brought to me in October, 1874. Healthy up to the age of nine, he had then measles, from which he recovered very slowly, and with marked feebleness of the legs. As time went on the power to use them increased, but by degrees there came upon him a certain stiffness, which extremely embarrassed him in all his movements. At the time I saw him his legs were equally developed, except that just above the left knee the thigh muscles were somewhat wasted. While in bed at rest the legs were quiet. When he stood up the spinal erectors became extremely rigid, and threw the back into a bow, while a strong effort of will was needed to keep the left leg quiet, and sometimes, the effort being insufficient, it was jerked upwards. When seated he kept the leg still by crossing over it the more manageable right leg. When he walked each leg in turn was jerked up by the gastrocnemii, so as to constitute a string-halt, which, as he was swayed to right or left, and bent back by the alternating activity of the spinal erectors, caused him to present a most curious appearance. Fig. 3 represents him just as he came to a stand after rapid walking, when the spine was bent forward, the belly thrust out, the legs bent, and the lad balancing on the ball of the right foot, with the left leg jerked up at a right angle.

At first I felt indisposed to attempt any treatment of this puzzling case. Various electrical treatment was tried and failed, such as induction currents

Fig. 3.

to the antagonist muscles, or long-continued induction currents to weary the spasmodically acting muscles and Remak's rapid alternatives.

A long series of atropia injections into the calf muscles met with more success, and the action of these muscles became distinctly less powerful and less troublesome. Next I weakened the back muscles by a series of repeated cross sections at different levels; and finally I put on him an apparatus which limited the extent to which the over-active muscles could move the various parts of the limbs. I did not cure him, but I most certainly did remarkably better his condition, and enabled him to rise, stand, and walk with far less fatigue and effort.

The last two of the cases I have here given involve spasm or increased spasm in groups of muscles accustomed to act together in order to secure equilibrium when standing, or to aid in the movements of progression. The cases first given were also examples of voluntary action bringing on or increasing spasm elsewhere, but, save in the case of yawning, and the consentaneous arm lifting which it causes in some hemiplegias, the muscles which contracted convulsively were not remote from those whose activity seemed to call them into morbid motion. But in the case which I shall now present, the most prominent feature was the fact that every or almost every voluntary motion caused extraordinary changes of or increase in the amount of the spasm, and this was the case whether the patient was prone or erect.

R. C., æt. 33, watchcase-maker, married, and has healthy children; no syphilis. His family history is bad; a sister, two aunts, and his mother have had palsies in middle life; an uncle had epilepsy, and a cousin dementia. He was always nervous and excitable, used no spirits, smoked moderately, and was always well until the summer of 1865, when he was two days unconscious from sunstroke, and has ever since been made weak by the heat of summer. About two years ago, in the summer of 1874, he

observed that while walking the legs felt weak, and he was obliged to stop, as if to regain power; after which the right leg would drag for a time. At the same time he began to have pain in the back of the neck and lumbar spine. These pains continue. In January, 1875, he noticed a slight but increasing tremor in the left arm, and in two or three months the strange condition which I shall try to describe.

When I first saw Mr. C. he was a healthy-looking man, of unusual intelligence, and marvellously patient under his great suffering. In sleep there was no movement; when he awakened he was conscious of the left hand being rigidly closed. In a few moments it began to twitch, the fingers moving as do those of a violin player. The slightest movement of any other limb, speaking, or eating—even if he be fed—causes the left arm to execute a constant motion of striking the bed or his side, the limb being the while extended. When he arose and walked, this action became more violent, and so much resembled the steady, rapid movement of a pendulum, that I spoke of it at once to my assistants as a case of what might be called, descriptively, *pendulum spasms*. In fact, its rhythmic regularity was astonishing. Dr. Sinkler timed it, on one occasion, as 157; and on several others I found it always exactly 160. It was as accurate as the heart in its motion, but certain things always increased either the power or the number of the motions. Thus if he stood up, having been seated, the number did not alter, but the force of the blow on the thigh increased remarkably.

If, while standing, he elevated and extended the right hand and arm to the shoulder level, instantly the rhythm mounted to 200; and when the right arm ceased to act, the number fell again speedily to 160.

When there was no pendulum spasm he could perform with the left arm any voluntary act not involving the hand, which itself never ceased to twitch; but while the swinging spasms lasted he could execute no volitional act, and the effort to move the limb enormously increased the spasms.

Excitement and emotion, and all forms of electricity, added to the force of the motions, but voluntary movements of other limbs increased the number more than the force. Attempts at passive motion, as the effort to fully extend the partially flexed fingers, cause intense pain in the occiput, just as the effort to overcome rigid gastrocnemii in certain cases gives rise to pain in the dorsal spine. He has power to stop the spasms by certain manœuvres. If he seizes the left hand with the right, and, flexing the left arm, holds it, there is a kind of general spasm; the left hand for a moment seems to struggle with increasing violence; he totters; the face is convulsed; there is horrible pain in the back of the head. Then he gently releases the left arm, which, save for a slight tremor or twitching of the unquiet fingers, remains at rest, and may not move in violent spasm for an hour or more, and is sometimes nearly still for twelve hours.

He avoids the use of one hand to stop the other, because of the great pain it causes in the head. When he stops the hand with his leg, he has little head pain, but it is altogether so unpleasant for him to check it that he rarely does so. When standing, if he wishes to stop the pendulum spasm, he throws the left leg back so as to trip the toe; the arm then falls in as it moves, and he brings the leg forward so as to catch the arm against the thigh, where its own spasm holds it. Then there is a general convulsive movement of the entire body, and the limb is at rest.

When the arm is hanging quiet at his side, it begins to move if he

walks a few steps, or if he lifts the right arm, in which at times—especially after sudden arrest of the spasm—I noticed some large tremor.

In all of this strange set of symptoms there is no loss of consciousness, no anæsthesia, no ocular trouble or spasm, no aural defect. When he walks long or fast, the legs have some disposition to become rigid; but this is an inconstant feature.

This patient is now under care of my colleague, Dr. Sinkler, to whom I am in debt for liberty to use his case. So far, nothing has been of any service.

There are several points of great interest about this notable case. No other is so good an illustration of the product of clonic spasm through remote voluntary activity. Also the mode of arrest is curious, and I should have added, in describing it, that a bystander can stop the spasms by securely holding the arm for a few moments, when the usual general contortions occur, and the limb ceases to move. Voluntary motions of remote parts—of any remote parts—set the spasms going. Forcible arrest of the spasmodic swing of the arm seems to cause a discharge of nerve force from numerous nerve centres, and so gives rise to a momentary generalized spasm. This last fact finds analogies in some spinal scleroses, and in some clonic local spasms, the arrest of which occasions remote or morbid activities.

I saw, in the war, a soldier who had a constant *see-saw spasm* of the left foot, caused by a nerve wound of the sciatic. The flexors and extensors acted by turns, so as to keep the foot in constant motion. When I held it firmly, he was seized at once with a general left-lateral convulsion, in which the face moved but slightly, without ocular spasm or loss of consciousness, but with occipital pain. As soon as the foot was released, the other motions ceased. Sensibility was impaired from the peripheral lesion.

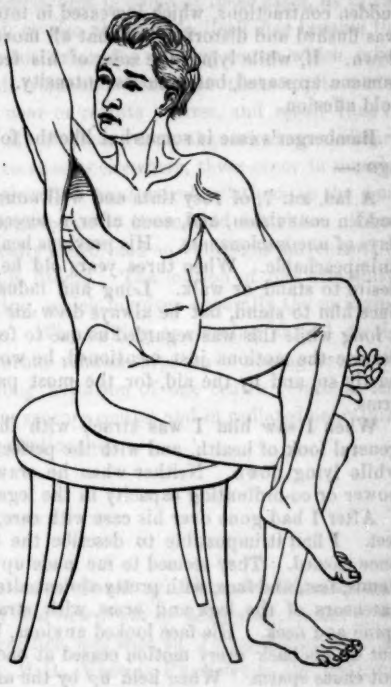
In the case of Col. P., described at p. 364 of my book on Nerve Injuries, there was a continual irregular threshing motion of an arm stump, which ceased for a time, when the stump was exercised in voluntary movement, but which extended over a large region of the same side (right) with sense of discomfort in the head if an attempt was made to hold the agitated stump. These peculiarities seem to me worthy of note in cases so obscure, and the history of which has been thus far imperfect, because we are without post-mortem results or interpretations.

There is yet another group of cases, happily most rare, in which, while the patient is at rest prone, or as in one case seated, no spasms exist; but when the upright posture is assumed, at once the patient is seized with general convulsive motions, which may or may not persist. Of such a disorder I have seen three cases.

The first and most singular was that of a journeyman tailor, about 28 years old, a man of lean make, and very anæmic. He had been guilty of no excesses, and had not had syphilis. His secretions were normal, and

his organs, to appearance, healthy. He had, however, worked hard in the cross-legged position which tailors assume, and had been constantly sewing late into the night. This was all that could be learned of his history.

Fig. 4.



When this man was seated or on his back, he could make every possible movement, slowly or as abruptly as he pleased. If he got up from his bed or a chair slowly and watchfully, and then stood still a moment, he could walk away as well as any one; but if he jumped up suddenly from the prone or the sitting posture, he was seized as by a spell with a convulsive attack, in which his head became giddy, but in which there did not seem to be the least loss of consciousness. The attitude assumed as he made a sudden attempt to get up hastily is difficult to describe, but figure 4 conveys a clearer idea of it than words will give. The right leg bent at the knee, the left was thrown over it, and grasped it in violent flexion. The body was twisted to the right, and the head also, while the right arm in extension was raised, and the left thrown outwards and backwards in extreme pronation. Then there was a general writhing of the whole frame, the face muscles twitching here and there, and with a groan of relief his attack was over.

Much pains were spent to learn if there was in this case any chance of explanation which would involve a suspicion of simulation. His malady, however, was very constant in its peculiarities. It had come on gradually, beginning with slight contortions; it made him unpopular in the work room, where it was looked upon as some kind of possession; nor had he anything to gain by malingering, while his face had always that look of gloom and melancholy which such a torment as his would be apt to inflict on a person of sensitive temperament.

Dr. C. Handfield Jones[1] briefly calls attention to cases in which spasms occur owing to the weight of the body being brought upon the feet.

He mentions that Bamberger relates the case of a youth æt. 19, convalescent from pneumonia, who had spasms of the legs when he touched the

[1] Functional Nervous Disorders, p. 398.

ground with his feet. There was tetanic rigidity, interrupted by violent sudden contractions, which increased in intensity. He says, also, the face was flushed and distorted, but that all movements ceased when the lad lay down. If, while lying, the soles of his feet were pressed, the same phenomena appeared, but with less intensity. He was cured by sedatives and cold affusion.

Bamberger's case is somewhat like the following, which I saw two years ago:—

A lad, æt. 7, of rosy tints and well nourished, had, when a year old, a sudden convulsion, and, soon after, a succession of fits, followed by several days of unconsciousness. His previous health was good; his family record unimpeachable. When three years old he began to creep, but showed no desire to stand or walk. Long and industrious efforts were made to induce him to stand, but he always drew his legs up and sunk down. For a long while this was regarded as due to feebleness. By and by, however, despite the motions just mentioned, he would maintain himself erect, or partly so, and by the aid, for the most part, of his vigorously developed arms.

When I saw him I was struck with the child's intelligence, with his general look of health, and with the perfect use he had of all his members while lying down. Neither when he crawled could I see any failure of power or co-ordinating capacity in the legs.

After I had gone over his case with care, his parents placed him on his feet. I find it impossible to describe the confusion of motions which at once ensued. They seemed to me made up of choreoid movements of the hands, feet, and face, with pretty violent alternate spasms of the flexors and extensors of the legs and arms, with strange rotatory twistings of the spine and neck. His face looked anxious, but twitched very little. When put on his back every motion ceased at once. Pressure on the soles did not cause spasm. When held up by the arms or by the shoulders he had no spasms, but as soon as the feet were on the floor and he tried to stand, the storm of convulsive motions swept over him. The effort of standing seemed to be needed to cause the result. If he tried to walk he was thrown down by the spasms, and therefore did nothing but creep.

Electricity did not cause in him any spasms. The leg muscles responded well to a moderate induction current. There was no disturbance of sensation anywhere. When his soles were tickled he drew them up a little jerkily, but with no spasm.

I regret that this interesting case was seen by me but twice, and that my notes of it are not more ample. His parents, when once they learned that I did not regard the case as hopeful, were indisposed to give much information about it, and seemed to fear that the poor little fellow would be looked upon as a medical curiosity.

I believe I shall have done a good service by directing attention to the fact that voluntary motion may give rise to various forms of spasm. It is familiar enough that morbid sensations may do so, or that in an over-excited state of motor centres, a normal sensation may occasion like results, as in tetanus. As regards the cases to which I have here called attention, two explanations lie open to us. Voluntary acts give rise to spasms in the

muscle willed to move, or in remote groups of muscles. There is at times an unusual discharge of nerve-force in some of these cases, as in the "lock spasms" I have reported, or else the muscle itself has become the means by its over-use of hypersensitizing the sensory centre which takes record of its activities, so that from this centre at times excito-motor impressions are radiated on to near or remote centres, and result thus in spasms. It will be found, in all of these cases, that when an ordinary functional motor act gives rise to spasms elsewhere, these occur in muscles which have physiological and therefore anatomical relations to the muscles which, by their normal use, gave rise to the morbid activities. Thus, the face muscles are physiologically allied, and so volitional movements of one of them may cause spasms in others. The motion of one arm starts spasms in the other; and walking, which involves naturally the swinging of the arms, has a like potency. Why talking or chewing should do the same is less clear, but such morbid relationships have analogues in the cases of neuralgia, where the long irritation of one centre results at last in the like disturbance of remoter sensory centres and in radiated neuralgias which are usually of unilateral relationship.

ART. II.—*Genital Irritation as a Cause of Nervous Disease, with reference more particularly to a new form of Muscular Spasm of the Flexors of the Lower Extremities, met with in Young Children.* By ALLAN MCLANE HAMILTON, M.D., Visiting Physician to the Epileptic and Paralytic Hospital on Blackwell's Island, N. Y., etc.

No causes of nervous disease have been more neglected in examination than those having their seat in the external organs of generation, while in reality they may be said to play a very important part in many instances where they are entirely overlooked. I have been so repeatedly reminded of this fact within the past few months, that I have been prompted to study them more carefully than I had hitherto, and the following paper embodies the results of my investigations.

It will be my purpose to describe these neuroses as follows:—

First: Those depending upon reflex irritation, and uncomplicated with, and disconnected from, sexual excitement.

Second: The element of erethism as a cause of central disease; such erethism being continued, or repeated at frequent intervals. This second variety of cause is distinguished from the first by an absence of the primary psychical element.

I believe these causes to have much to do with most of the functional neuroses of infancy and childhood, and I take this occasion to refer to Dr.

Jacobi's[1] recent valuable paper upon the subject. Dr. Sayre[2] has also added many valuable cases to the literature of neurology. At one time, and not so long ago, most of the reflex neuroses were thought to follow that medical scapegoat, dentition, or else to depend upon intestinal irritation due to ascarides or other parasites. We now have, I think, a new direction in which to turn, and in many instances, we are rewarded for our efforts.

While recognizing the existence of such a condition in infancy as nervous disease dependent upon genital irritation, and accepting it as a common one, I am compelled to believe that so far as the external organs of generation in the adult are concerned, the field is more restricted. This statement applies more to the male than to the female.

The complex character of the nerves which supply the genito-urinary organs is such as to demand the most careful study, and the secondary relationship of these organs to the cerebro-spinal axis, is of still greater interest. A close intercommunication of the cerebro-spinal and sympathetic fibres is found to be the striking characteristic of nervous distribution. We find that the greater number of sympathetic fibres is derived from the hypogastric plexus which is divided at its lower part into the pelvic plexuses, and these supply, on each side, the bladder, vas deferens, the vesicula seminales, and a part of the penis; and in the female, the uterus, ovaries, vagina, and external organs of generation. Numerous branches of the sacral, and the pudic nerve supply the urethra, while the glans is very abundantly innervated, particularly by sensory fibres. Kölliker[3] has found Pacinian bodies at the ends of the terminal nerves of this region in animals, and he, as well as other observers, has found tactile corpuscles in the clitoris. Arndt has recently advanced the opinion that the Pacinian corpuscles had some means of connection with the vaso-motor fibres.

In the consideration of physiological action we arrive at the most attractive part of our subject, for here it is necessary to dwell upon the relation these parts bear to the general nervous system and the mind. First of all we are to familiarize ourselves with a certain function of nerves, namely, inhibition, and then to consider the connection of inhibition with reflex action. The transmission of sensory impulses from these parts, the response of the cord or brain, and the local or central excitation of sympathetic filaments, demand a great deal of attention and discussion. Anatomy and physiology have taught us that erection of the penis or clitoris depends upon paresis of vaso-motor fibres, that reflex sensations from these parts produce various sensory and motorial phenomena, due to impressions carried to the cord and brain, or still again to curious psychical states. We have only to study the physiological condition, known as the orgasm,

[1] Amer. Journ. of Obstetrics, Feb. 1876.

[2] Spinal Anæmia, etc., Trans. of Amer. Med. Association, 1875.

[3] Kölliker's Manual of Human Microscopical Anatomy. Translation by Busk and Huxley, p. 634.

to realize how general the action upon the nervous system may be. This is expressed by the involvement of the pneumogastric nerve, and as a consequence, there are altered respiration and irregularity of heart action; by flushing of the face or pallor, dependent upon altered functions of the sympathetic, by reflex sensory exaltation; and finally, by mental exhilaration and reaction.

After dwelling upon this side of the question it is not difficult to understand how various pathological states may result from any disturbance of equilibrium. The theory of inhibitory action as in the penis is explained most sensibly by Mr. Lauder Brunton, in the fourth volume of the *West Riding Asylum Reports*. He says:—

"The bloodvessels of the penis are kept in a state of moderate contraction by the stimulus which the vaso-motor nerves supply to their muscular walls. This stimulus is derived, in part at least, from ganglia lying close to the vessels, and to these ganglia proceed certain nerves; the *nervi erigentes*, which arise from the sacral plexus. When the nerves are irritated the ganglia cease to stimulate the vascular walls, and these constantly relax, and yield to the current of the blood which pours into and distends them, so that the organ becomes swollen and an erection takes place. After the irritation of the nerves has ceased, the ganglia reassert their power over the vessels, and cause them to contract, so that the blood is again driven out, and the organ becomes flaccid."

A more extended view of the physiology embraces the participation of other ganglia and nerves. Several centres are called into action, and more extensive processes follow, and we then find sensory, motor, and psychical responses as evidences of a general participation of the cerebro-spinal system. Sensory impressions are conveyed to inhibitory centres, and from thence to motor centres, or are carried still further to the brain. This vaso-motor stimulus, alluded to in speaking of the process of erection, may be sent from remote centres, and even many vaso-motor fibres of the vessels of the penis are derived from filaments which take their origin in the vaso-motor centre in the medulla. This may be verified experimentally by cutting the splanchnics. The intestinal vessels supplied by fibres from the medulla, just as some of those of the penis are, will, after such section, become gorged with blood.

A law laid down by neuro-physiologists is, that reflex impressions of two kinds may be followed by different results. Thus one kind of irritation may produce a well-defined response, and another a still more decided form. For instance, tickling the feet produces involuntary movements, and sometimes, in susceptible persons, involuntary discharge of urine, while a more severe scratching will provoke nothing of the kind. This proves that two sets of ganglia exist, one a motor, another an inhibitory, which to some degree controls the motor when the impression is sufficiently strong. By inhibitory impressions of certain kinds, we may have, if I may use the term, a great number of *reflections*. The original sensory impression may be carried directly to an inhibitory centre of the cord, and as a result there may be alterations in its vascularity through alteration of function in the

vaso-motor fibres, or such vaso-motor disturbance may be located in the organs themselves, at the starting point, through excitation of the moderator fibres. Then again by one of the direct connections I have mentioned the sentient impression may go directly to the medulla, and the centres there undergo a change, subsequent to the transmitted excitement. Here we have ischæmia, and as a result various peculiar alterations of function in nerves originating from that part of the cerebro-spinal system. Dr. Brunton, whom I have before referred to, presents with his article an ingenious chart in explanation of the more complex phenomena of this form of nerve action, showing the connection of the point of irritation with sensory centres, and motor centres, presiding over muscular contraction, muscular co-ordination, vascular changes, etc. These two are connected by afferent and efferent nerves with an emotional and finally with a centre of ideation. The connection of the two centres of emotion and sensation may be directly connected with that of ideation.

Now, while apologizing for this somewhat disconnected consideration of the physiology of the subject, for justice could not be fairly paid it without wandering into the broad field of general neuro-physiology, I must mention several other physiological facts which have a direct connection with the pathology of the various conditions of which I am to speak. The first of these is, that stimulation applied to the terminal end of the nerve passing from the periphery does not go *always* to a definite nerve-centre, the impression generally goes to a number; and here I wish to say that I do not mean to convey the impression that nerve-tubes are not continuous channels, for physiology has taught us that one exact sensation may be conveyed directly by a special channel to a particular centre. I allude only to a gross irritation. Special impressions, often repeated, will make new channels for themselves, and a particular variety of irritation may be so often reflected upon one spot that the function of the locality will be impaired. The application of this will become apparent when we witness certain sensory impressions in one case, certain forms of contraction in another, and mental disturbance in a third. When the pathological states come under discussion we have two or three things to turn our attention to, namely: sensory impressions at the periphery, their transmission and the results. In regard to the first, the irritation may be of two characters, either those of a painful, or of a purely sexual or agreeable nature, but both liable to be conveyed to the nerve-centre, and do harm. The production of the first we know to be due to the direct injury of the sentient nerves, while of the second we do not know so much. Why tactile irritation should be received at the penis in a different way from painful, and transmitted in an altered form, while parts equally rich in sensory nerves should receive them in an entirely different manner, is a question for the physiologist to answer; or still further, why should one form of irritation produce even a temporary unconsciousness at times, while at others it does nothing of the kind? We

know very well that such excitations and resulting phenomena are manifested through impressions carried to the medulla; but why these special nerves receive a peculiarly distinct sensation remains to be explained. The prick of a pin, the application of electricity, and other stimuli will not produce the same impression that friction does. As the clinical results of such morbid impressions, there is nearly always motor response, expressed either by convulsions of both lower limbs, with a disposition to flexion of the legs and thighs, an adduction of the toes which is marked, or else there are general movements of both upper and lower limbs. There may be convulsions which are epileptic in character, and there is often mental disturbance. This may vary from simple irritability to confirmed dementia. There may be melancholia or mania, or else a condition bordering on imbecility. In these latter cases, as well as others, I think the sexual element enters extensively into the question. In fact, I doubt whether there are any cases of mental trouble connected with genital irritation where masturbation, either unconscious or wilful, does not at some time enter. The result of long-continued reflection of sexual impressions is shown in every-day practice chiefly among ataxics and epileptics, so I will not discuss them. An important subject for consideration is the hysterical element, which is very common, and may mislead the examiner. Various dysæsthesiæ are spoken of by the patients, and include a coldness or wetness of the glans, or, on the other hand, there may be burning sensations. There are in reality no such conditions, for the temperature of the parts alluded to will be found to be perfectly normal. Trousseau[1] says, in this connection:—

"The individuals complain of very transitory sensations of heat, burning, or cold; they compare them to sensations caused by a current of electricity, or cold air, or by tepid water; they also complain of pains similar to those produced by a violent squeeze, etc."

I have noticed that the patients who make these complaints are nearly always masturbators, or suffer from spermatorrhœa, and in dispensary practice I have met with so many of them who tell this story, that when one comes complaining that his penis is cold or hot, or something else, I always suspect him to be a victim of this habit, and endeavour to verify my suspicions, and nearly always meet with success. It is of absolute importance to settle the question whether the abnormal condition of the urinary organs is primary or secondary to the nervous symptoms. As we know, many forms of central nervous disease are characterized by striking urinary symptoms; thus, in the paraplegia of myelitis, we often find erections of the penis, in other stages there is incontinence of urine. In the earlier stages of sclerosis there are seminal emissions and erethism, while the later are characterized by impotency, with paralysis of the bladder. With certain varieties of true spinal disease, there is urinary involvement,

[1] Lectures on Clinical Medicine, vol. ii. p. 283.

as well as decided atony or paresis of the muscular fibres of the rectum, with constipation or involuntary passages as the result. In other forms, such as essential adult spinal paralysis, there is no bladder or rectal trouble, the lesion being in the anterior horns of the cord. Subacute spinal meningitis is characterized by muscular spasms, by pain following motion of the lower limbs, or by darting pains running from the spine to the lower extremities. Other forms of paraplegia may be differentiated from those of the reflex form by the suddenness of their onset. According to Brown-Séquard[1] and other observers, we may conclude that the difference between paraplegia due to myelitis, its most common cause, and reflex trouble, is, that in the latter there is no constipation, no constricting band about the waist, no progress upwards of the paralysis, and the paralysis is incomplete, there are never twitchings nor spasms, there is no pain in the spine, no formication nor sensation of heat and cold, and rarely anæsthesia. The prognosis is good. The urinary troubles in true spinal disease, when they occur, are always secondary, and I think there should be no difficulty in recognizing them.

Now in regard to the alteration of physiological function that attends this form of disease, we have no less an authority to quote than Brown-Séquard. He considers the possible results that may follow a formidable reflex irritation as follows: First, contraction of the bloodvessels; second, morbid reflex influence on nutrition. In the discussion of the first subject he supposes that spasms of the vessels of the cord may be a consequence, through a stimulation of some excito-motor nerve reflected upon them by the cerebro-spinal axis. He has seen this contraction himself after ligation of the hilus of the kidney. In regard to the second question, he considers that there are no nutritive changes. I must differ from our eminent teacher in regard to the consequence of any protracted vascular change. These cases are so numerous that it is surprising that he does not acknowledge the structural changes that follow even a few months of active hyperæmia or anæmia of the nervous substance. It is true most of the cases of reflex paraplegia have been rapidly cured; but those I have heard of were seen in a short time after commencement of the disease. As a consequence of reflex excitation lasting for years, I think that secondary changes are very probable results.

To consider the pathological conditions systematically, we must first dwell upon the causes that may produce certain symptoms, and the form and appearance of such symptoms. We may enumerate the causes as continued morbid peripheral irritation sent from the genitals, either to the bladder, cord, or medulla oblongata. The character of this irritation will be presently considered. As a result of such action, I have divided the prominent neuric symptoms as follows:—

[1] Paralysis of the Lower Extremities.

First. Those expressed by want of muscular power.	Paresis, including paraplegia, and partial paresis of either isolated groups of muscles. Paresis of the muscular fibres of the bladder.
Second. Sensory.	Hyperæsthesia. Anæsthesia. Dysæsthesia.
Third. Vaso-motor.	Priapism. Local hyperæmia.
Fourth. Hyperkinesis.	Choreic movements. Transitory contractions.
Fifth. Psychical disturbances.	Loss of consciousness. Impairment of memory. Irritability of temper. Melancholia. Dementia.

The patient may present many of these symptoms at the same time. These are dependent upon a limited number of morbid conditions, so far as we know. In children it has been found that various congenital defects and acquired bad habits have preceded the appearance of one or more of them, and in adult life we have two causes, venereal excess, a common one; stricture and other urethral difficulties, rare ones. Besides these, which act by inhibitory reflection, we have various local neuroses of the penis, which may be traumatic or idiopathic. In regard to published cases, we have very little material to refer to. Graves[1] reports a case of paraplegia due to stricture, Otis[2] has detailed some observations, and Sayre has published his cases from time to time. Before entering into the history of the cases of these observers, I think it will be more proper to consider the morbid condition of the organs under discussion. So far our attention has been called to the condition of phimosis or other genital irritation, and stricture of the urethra. Of the first, Dr. Sayre has presented us with ten cases which he reported at the last meeting of the American Medical Association. These children all suffered with a peculiar train of nervous symptoms which are included in the table I have just detailed. Of Dr. Sayre's patients, six were between three and four, two were two years old, and two were five years old. Of these, eight were boys and two were girls; in the boys there was generally congenital phimosis, with agglutination of the prepuce and glans; in the girls an elongated and inflamed clitoris. Symptoms of want of power or imperfect locomotion, adduction of the lower limbs, atrophy of the muscles of the thighs and legs, incontinence of urine, and various mental disturbances of greater or less gravity, such as hysterical laughter, irritability of temper, or imbecility, were also presented. After operation Dr. Sayre's cases re-

[1] Quoted by Black (Functional Diseases of the Reproductive Organs).
[2] Otis on Reflex Irritations throughout the Genito-Urinary Tract, etc.

covered in short spaces of time, varying from a few hours to as many weeks. In some of these patients the nervous symptoms appeared a short time after, and in others at birth. Dr. Sayre[1] includes in his second paper several cases brought to him by medical men throughout the country. Dr. Francis H. Brown,[2] of Boston, reports a case of paraplegia in a boy ten years of age. With the paraplegia there was incontinence of urine. Dr. Brown's attention being brought to the subject by Dr. Sayre's brochure, he examined the penis, and found a severe balanitis, with preputial constriction. After circumcision the cure was rapidly effected. Drs. Green and Leech also contribute cases which Dr. Sayre quotes. It has been my fortune to see four cases of this kind, one at the request of Dr. Sayre, another with Dr. Harrigan, of Brooklyn, a third in my own practice, and another with Dr. V. P. Gibney, of New York.

CASE I.—Dr. Sayre's case was a boy seven years old, well nourished, with rosy cheeks and well-rounded muscles of the upper extremities. His morbid condition had existed from birth, and he possessed a congenital phimosis, the prepuce being firmly fastened over the glans, and the preputial orifice was very small and surrounded by a rigid ring of toughened skin. On entering the room I was struck by the extraordinary restlessness and activity of the child. He was lying on the bed, and his lower limbs were drawn up and agitated by irregular convulsions. The arms were also convulsed, and their movements were distinctly choreic. When held upright, the child was unable to stand, not from any paresis, but from the apparent loss of co-ordinating power, the legs becoming rigid, and the toes of both feet adducted, more particularly the left. The child was unable to speak, but attracted the attention of those around him by queer sounds. His face was distorted, just as we often see it in old choreic patients, but there was no evidence of imbecility. I did not infer that there was any mental trouble, except a preponderance of emotional disturbance, the boy being very fearful that he was to be hurt. Upon interrogation I found that he was quiet during sleep, that his appetite was good, and that there was no irregularity or disturbance of the functions of the bowels or bladder. The penis was not as sensitive as I had expected to find it from Dr. Sayre's description of previous cases. Titillation did not produce immediate erection, nor any increase of the spasmodic movements. On taking him upon my lap, the thighs and legs were immediately drawn up. There was no evident pain produced by pressure on the spine.

CASE II.—Rosa A., five years old, very pale and delicate. Like one of Dr. Sayre's cases, this child was almost asphyxiated when born, and it was nearly ten minutes before she was resuscitated. A year after birth she contracted scarlet fever, but no other trouble supervened. After birth it was noticed that there was want of power in the lower extremities; she was entirely unable to stand, and as soon as she was held in an upright position her legs became stiff. Her intelligence was unaffected, and she did not suffer pain in any part of the body.

Present condition.—The legs are well proportioned, and there is no atrophy, the temperature of both limbs is not lowered, but there is slight

[1] Spinal Anæmia, etc. [2] Ibid., p. 20.

hyperæsthesia. When held in an upright position by her father, who accompanied her, the legs become rigid, the toes cross each other, and one foot seems inclined to cover its fellow. With this rigidity there are irregular convulsive movements, there is a marked contraction of the sural muscles, which draws up the heels. When laid upon her back, the thighs are drawn up upon the pelvis, and this her father states is her position at night. At this time the head is drawn back and downwards by firm contraction of the trapezius and other muscles of the neck. An examination of the genitals disclosed a very large cyanotic clitoris quite erect. There was no history of worms. Unfortunately, for it was a dispensary case, the father would not allow anything to be done in the way of surgical interference.

CASE III. *Convulsions simulating Epilepsy occurring with Congenital Phimosis.*—This patient was a boy seven years old. He had been subject from early infancy to convulsions, which appeared at varying intervals, and were characterized by their short duration, absence of the element of sleep subsequent to the convulsion, and of the pale stage. His bodily condition was good, the skin being clear, and the muscular development perfect. A phimosis and contracted preputial orifice existed. There was incontinence of urine. No history of traumatism of any kind. Patient's immediate family healthy. I recommended circumcision.

CASE IV.—I was enabled to examine this patient through the courtesy of Dr. Gibney. James D., aged nine and a half, a well-developed boy, of nervous temperament, with dark eyes and hair. Dr. Gibney obtained the following history: He was one of twelve children, three of whom were still-born, and five have died of exanthematous diseases. The mother was in labour forty-eight hours when this child was born, and she was delivered finally by the forceps, a mark of which still remains in front of the child's right ear; convulsions two or three days immediately succeeding birth. When nine months old the mother thought it was time for him to begin sitting alone, and placed him on the floor for this purpose, when he rolled over on his side quite rigidly. He did not begin to learn to talk until three years of age, and then was a long time in making himself understood. He began to stand, and made attempts to walk when four years old, when the spasm was noticed more markedly. There was no history of painful erections nor anything like masturbation, but there was nocturnal incontinence.

Present condition.—The boy's whole body is agitated by choreic movements, but more particularly of the legs, which present the same appearance in Cases I. and II. I have alluded to. There is the same rigidity, the same drawing up of the heels, and the same dancing motion. This is seen when he stands up. His glans penis is covered by a prepuce, the orifice of which only admits the head of a small silver probe.

Besides this case, Dr. Gibney brought to me a boy having a very tight prepuce, which it was difficult to retract. Beneath it was a purplish-red glans, which, when uncovered, stood out like a ball, as the constriction at the base was excessive. This boy, eight years old, has had chorea twice; two years ago, it lasted six weeks. The disease again appeared two weeks ago. Whether the tight foreskin is a coincidence or a cause, I am not prepared to say.

A review of these cases enables us, I think, to draw the following conclusions: That convulsive movements, more particularly of the lower

extremities, the spastic contractions of the flexors of the thighs and legs, are connected, in some children, with a continued irritability of either the glans penis or the clitoris. That, as a rule, beyond irritability, there are no mental symptoms. That the exaggerated power, or hyperkinesis, is the rule. That atrophy, or actual akinesis, is exceptional. That want of coördinating power is common. I infer from Dr. Sayre's results that the removal of the seat of irritation is followed by a cure.

After discussing this part of the subject, I invite attention to those nervous conditions following another form of irritation, namely, that connected with sexual excitement, into which the psychical element enters largely, and which I believe to be the most important part of the subject. That venereal excesses and masturbation are causes of nervous disease, in the greater number of instances, I have no doubt. I have alluded to the anatomical relation of these parts, and I have now only to hint at the effects of repeated intense impressions transmitted from the genitals to the medulla, and the processes that follow. The pathology of gastric epilepsy, when even a hearty meal may induce a series of convulsions, is too well known for me to dwell upon longer than to point out the comparison between the violence of this excitement and that received and transmitted by the sensory nerves of the penis. Clinical experience presents this fact much more forcibly to our minds. Not only have I seen sciatica, and other forms of neuralgia, induced by nothing else than excessive venereal indulgence or onanism, but epilepsy as well. Cerebral and spinal irritation is the most persistent and common pathological condition connected with venery, and, if continued, we know that, as a result, structural changes, notably sclerosis, will occur. And here I may give a case of epilepsy, dependent upon masturbation, probably springing from a congenital defect.

CASE V.—A girl, 16 years old, has had convulsions for the past four years, having sometimes several during the twenty-four hours. There was a mental condition bordering on melancholia. Her skin was blue and dusky, and pressure left a white mark. The lips were swollen, and the lines were obliterated so that the familiar expression so constant in melancholia was strongly marked. Her demeanor was shy, and she rarely looked any one full in the face. Under tonics and every variety of special treatment there was no amelioration. Masturbation was acknowledged, but she stated that she had no control over herself. Careful watching and the use of the muff at night broke up the habit. A week after this improvement took place, and the number of convulsions was greatly lessened. She is now entirely well. The clitoris of this patient was very long, quite blue and angry looking, and very easily erected.

Of all morbid changes, following long-repeated venery, the moral are most striking. That insanity may follow, there can be no doubt; and in the few cases occurring among children, masturbation has been shown to

be usually the exciting cause. Dr. Kinnicutt[1] publishes two cases of interest. One of them is the following:—

The patient was a girl 13 years of age. Five weeks from the commencement of an attack of croupous pneumonia, when convalescence was taking place, the parents noticed sudden outbreaks of a peculiar mental change. A short time after going to bed she arose and went down to her father's room in her night dress. Her expression was wild, and she astonished him by singing, dancing, and reciting snatches of poetry. Her answers to the inquiries showed that she was labouring under very vivid hallucinations of sight and hearing. She said that she was surrounded by people who were determined to murder her; that there was blood upon her clothes, etc. She remained in this excited condition for forty-eight hours, and did not sleep any part of this time. This was followed by a profoundly melancholic state, which continued for some days, when recovery took place under judicious treatment. Meanwhile she confessed the bad habit, which had been the cause of the trouble.

I have also seen two cases of children in my own practice, besides that alluded to above; one a boy of twelve years, the other a girl of fifteen. In both of these onanism was the cause. Both children had well-marked delusions, and improved under mechanical restraint and watching. The first case had had incontinence of urine during infancy, which lasted until the fifth year. Among adults, I think this cause is not so common as is generally supposed, but still it is often met with.

I have now at the hospital for epileptics and paralytics, on Blackwell's Island, a girl fifteen years old who has frequent epileptic attacks, both of *haut mal* and *petit mal*. As my suspicions were so directed, I found she was a confirmed masturbator, and she confessed having practised self-abuse several times a day. Her genitals were red and swollen, and there was a profuse discharge of pus. There were many scratch-marks in the neighbourhood of the vulva, and much pruritis. Unlike the other case I have mentioned, there was no malformation of the external organs of generation.

It remains for us now to consider stricture of the urethra as the cause of nervous symptoms. As I have already said, I believe it rarely produces other than local troubles. Feeling my own want of experience, I have written to several medical men who devote their entire attention to genito-urinary affections, and herewith append portions of their replies. Dr. Keyes says:—

"I think the tendency of the present day is to ascribe vastly too much importance to genital irritations, stricture, etc., as a cause of different neuroses, than they deserve. I occasionally see instances of the latter neurosis reflex from the genito-urinary system, but they are far from common, although my daily duties bring me into contact with genito-urinary troubles. . . . I believe the sexual element, generally totally ignored, has usually more to do with the neuroses in question than any other one factor."

Dr. Sturgis informs me that these cases are very uncommon in his practice. Dr. Gouley, to some degree, takes an opposite view. In answer to my note, he says:—

"In this connection I wish to state that for many years my attention has been attracted to the various neuroses, and other reflex phenomena arising in consequence of irritation of the genital and urinary organs."

[1] Trans. Amer. Neurological Association, 1875, p. 196.

On page 16 of his admirable work, Dr. Gouley calls attention to the subject as follows: "The brain and nervous system are sometimes in a state of irritation leading to a train of phenomena which have been properly called urinary neuroses."

Most of these cases have been reported by Dr. Otis, and one or two other American authors. Neuralgia is, perhaps, the most common neurosis connected with urethral stricture. Neucourt[1] has described forms of lumbar neuralgia depending upon painful spasmodic constriction of the urethra, and Gouley also alludes to this neuralgic condition.

"It is a common thing," he says, "for persons to consult their medical attendants for troublesome and long-standing sciatica, often confined to the left side, with the story that they have been cupped and blistered repeatedly, and have made use of hypodermic injections, etc., with no lasting relief. Close examination of such cases rarely fails to bring to light some disorder of the urinary organs, the cure or relief of which speedily removes all existing nervous complications."

Spasmodic stricture is sometimes followed by paraplegia, or vesical paralysis, generally of short duration. Dr. Otis's[2] pamphlet upon reflex irritations lies before me, and in turning over its pages I find nineteen cases related, which as a rule treat of local symptoms. Case I., as far as I can judge, presents no indication of nervous trouble. Case II. is characterized by a condition denominated by the author, "nervous uneasiness." Case III. presents as its chief symptom spasmodic stricture with a gleet. This spasm was induced by the passage of a sound. Case IX. presents symptoms of spinal congestion. Cases XII. and XIX. rhythmical contractions of the cremaster muscles. All the others present no nervous features, which I think worthy of notice, as evidences of concurrence of the general nervous system. All of these local reflex phenomena exist in every cavity lined with mucous membrane, and richly supplied with sentient nerves. In nearly every one of Dr. Otis's cases there was inflammatory trouble. That any *long* continued irritation, at any peripheral part of the body, particularly where the nerve supply is abundant, may produce serious neuric symptoms there can be no manner of doubt, but that these troubles are as constant and common as Dr. Otis suggests, is to my mind not at all certain. In some individuals of a nervous diathesis such a condition is a possible one with stricture or contracted meatus. What such stricture or contraction is must be determined by the medical men who make these things a special study. I must differ, however, with Dr. Otis in regard to the normal calibre of the meatus and urethra, and while carefully avoiding any possibility of trespassing on the field of the surgeon, I am compelled to believe that rapid and extreme dilatation of the urethra must be followed by bad results, and they are oftentimes sudden and severe. I therefore do not

[1] Quoted by Van Buren and Keyes.

[2] On Reflex Irritations, etc. New York, 1875.

think dilatation should be carried beyond a reasonable limit, unless there is a great necessity for so doing. What this normal calibre is I do not think has yet been determined. Dr. Otis has made a comparative table which was published in the pamphlet I have before alluded to, in which a relative proportion between the calibre of the urethra, and the diameter of the penis is fixed upon. It suggested itself to me that in individuals who were indulgent in the matter of sexual gratification, the penis must become larger in calibre from constant active or passive hyperæmia, and the ratio between the external diameter, and that of the meatus altered to a great extent. It is either Curling or Roubeaud who quotes a case where the first intercourse of an individual was followed by a varicose condition and permanent enlargement. If what I say is true, it would be difficult to make any comparison of this kind that would be at all exact. One point deserves special consideration, and I refer to the contraction of the meatus. Hancock,[1] describing the anatomy of the urethra, speaks of the muscular coat which forms a sort of a sphincter at the lips of the meatus. If this is the case a natural narrowing must be the condition at this point, and considering the functions of such muscular constrictions at other parts of the body, we are justified, I think, in here looking for some special duty. Although the urethra is narrower at some other parts, I am of the opinion that this narrowing of the external orifice, besides making the stream more compact at its exit, has something to do in giving the muscular fibres of the posterior part of the urethra and bladder, work to do which keeps up their nervous tone, and consequently their integrity of action. We may assume, however, when this orifice is closed after ulcerative action, or fails to admit a moderately large sound, that it should be enlarged. So too the urethra; very large sounds in my opinion do more harm than good. In more instances than one has dilatation by Holt's instrument produced such an impression upon the nervous system as to cause death, and we all know that moderate sounding is frequently followed by violent nervous rigors, and other troubles suggestive of a profound impression upon the general nervous system. Should there be doubt in the mind of the medical man in regard to the patient's condition, he must study intelligently the symptoms of true central difficulty. He will find that motorial symptoms expressed by loss of power are nearly always the result of spinal or cerebral organic disease, that, on the contrary, transitory loss of power, usually unaccompanied by anæsthesia, betokens some inconstant disturbance in the supply of nerve force. These reflex conditions, as a rule, are more the result of meningeal irritation than anything else. Exalted function is therefore to be expected with hyperæsthesia.

These cases are so uncommon that mistakes in diagnosis are likely to be made. It is absolutely necessary, therefore, to exercise the greatest

[1] Hancock's Anatomy and Physiology of the Urethra, 1852.

caution; but the duration of the trouble and the antecedent history should enable the physician to discover his patient's ailment. Verneuil has called attention to a case of neuralgia due to a neuroma in the prepuce. The pain was severe, and only relieved by an operation. Surgeons are familiar with small exquisitely tender spots that are often left after venereal sores, particularly when they appear beneath the glans. These are generally not permanent. The prognosis of all these affections is good, provided a correct diagnosis is made, which is not always an easy matter, unless one is on the alert. In the neuroses found with contracted prepuce, we take into consideration the contraction of the flexors, the *false* talipes, the choreic movements, and the general irritability of the patient. The discovery of a prepuce red and adherent to the glans, and capable of being erected easily, calls for removal, and a cure is probably the result. In reflex paraplegia, or other neuroses distinctly traceable to the penis, the division of the stricture is always followed by amelioration or total disappearance of the morbid condition.

The question of sexual disturbance is a more serious one, and moderation or abstinence is to be enforced before expecting good results. As to treatment, the indication undoubtedly is to reduce the irritability at the nervous centres, and to remove the peripheral point of irritation. The surgical means I have alluded to are generally sufficient, combined with local spinal anæmiants and sedatives, such as conium and the bromides, ice and ether spray to the spine, electricity or massage for the muscles, and sometimes orthopædic apparatus.

There is a tendency, I think, to attach vastly too much importance to the causes arising at the genitals as factors of nervous disease, and while recognizing the important part they often play in the production of such derangements, I think some of us are too frequently inclined to remove the foreskin or dilate the urethra, where in one case the covering of the glans is a normal condition, and in the other the canal is large enough to perform the functions intended by nature.

ART. III.—*The Physiological Action of Sanguinarina, the Alkaloid of Sanguinaria Canadensis.*[1] By ROBERT MEADE SMITH, A.M., M.D., one of the Resident Physicians in the Episcopal Hospital, Philadelphia.

THE chief end to be aimed at in investigating the physiological action of remedies, is to discover what structures are affected by the drug in question.

[1] This article is an abstract of one of the theses to which the alumni prize was awarded at the Commencement of the Medical Department of the University of Pennsylvania, in March, 1876.

To accomplish this, the simple administration of the drug is of no avail; we must isolate each individual organ, which, from the general action of the substance, we suppose to be affected, so as either to prevent the poisoned blood from reaching it, and then seeing whether the condition, which we suppose to be due to the poisoned state of that organ, be absent, or by confining the poison to that organ, and then expecting an aggravation of the abnormal condition; in other words, it must be accomplished by a process of exclusion. By determining the general action of a drug, we may guess at what structures are affected, but experiments, on the plan which I have mentioned above, are necessary to verify or refute these hypotheses. An acquaintance with the general action of the poison, however, is of course first needed before we can attempt to explain individual symptoms.[1] I have made a number of experiments in studying the general action of sanguinarina, of which I give the following as examples:—

Expt. I.—Small cat. 1.30 P. M., 0.0125 grm. subcutaneously: no marked symptoms, but general uneasiness. 1.35 P. M., 0.024 grm. subcutaneously: pupils small; respiration 60 per minute. 1.50 P. M., 0.02 grm., subcutaneously: pupils slightly dilated; drowsy. 2.13 P. M., 0.0175 grm., injected through a tube into stomach: respiration 100 per minute; retching; tongue protruding; constant chewing movement. 2.21 P. M., respiration 173 per minute; profuse salivation; micturition. 2.23 P. M., watery alvine evacuation; constant panting. 2.25 P. M., vomits violently; constant retching; pupils largely dilated; cutaneous sensibilty increased; violent extension of head; muscular inco-ordination. 2.45 P.M., defecates. 4.30 P. M., defecates. 6 P. M., greatly recovered; next day apparently well.

Expt. II.—Pigeon. 12.24 P. M., 0.024 grm. subcutaneously: flies wildly. 12.38, attempt at emesis. At 12.42 and 12.52 P. M., 0.025 grm., subcutaneously: unable to stand. 12.58, vomits. 3 P. M., 0.025 grm., into stomach through a tube: defecates; muscular trembling; remains crouching for several hours; unable to stand, walk, or fly; motionless when touched; was returned to its cage; dead next morning.

Expt. III.—Guinea-pig. 1.51 P. M., 0.0375 grm. subcutaneously: micturition; chewing motion. 2.02 P. M., 0.0375 grm. subcutaneously: constant backward movement. 2.10 P. M., 0.0375 grm. into stomach through a tube: falls immediately on its side; violent retching; unable to rise. 2.20 P. M., 0.035 grm. into stomach: retching and staggering; falls over; violent convulsions; extensions of head; gasping. 2.26 dead.

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[1] The sanguinarina employed in my experiments was a crystalline sulphate, prepared for me in the laboratory of Messrs. Hance, Bro. & White, Philadelphia, and as it agreed entirely in its physiological effects and behaviour to tests with samples obtained from other sources (Merck's article), there can be no doubt as to its purity. I administered it in a perfectly neutral aqueous (distilled) solution, strength 1 c.c. = 0.025 grm. When, however, I desired to give a larger dose, I found that by adding the salt to warm water, I could get a permanent solution as strong as 1 c.c. = 0.05 grm. At no one time was more than 1 c.c. of the solution injected subcutaneously in frogs or into a vein toward the heart in mammals. The instruments used for nerve irritation in all my experiments, unless otherwise specified, were one Grove cell, eighty-one millimetres high and fifty-eight millimetres in diameter, Dubois Reymond's induction apparatus, occasionally with Helmholtz's modification, and Ludwig's electrodes. Opening and closing induction shocks were produced through Dubois Reymond's key.

Expt. IV.—Frog. Weight 29 grms. 9.47 A. M., 0.025 grm. subcutaneously: jumps away; pupils widely dilated. 9.52, violent inspiration. 9.53, extreme extension of head; slight convulsions. 9.56, more marked tetanus; very violent clonic spasms. 10 A. M., chest opened; heart beating irregularly, feebly, and slowly; auricle sometimes making two beats to one of the ventricle, which finally comes to rest in systole.

Expt. V.—Frog. Weight 28 grms. 10.48, 0.0125 grm. subcutaneously. 10.50, extension of head; slight convulsions; anterior extremities rigid. 10.59, muscular inco-ordination; animal in a state of adynamia. 11.1, chest opened; heart beating 16 per minute; touching cord causes only slight movement.

The most marked feature in poisoning by sanguinarina, is the complete prostration and adynamia which ultimately appears, usually, however, preceded by a stage of excitement, in which occur clonic convulsions. When a small dose is given to a cold-blooded animal, the first symptom noticed is a stage of increased respiratory excitement, usually followed, though sometimes accompanied, by dilatation of the pupil; then the respiratory movements become slower and slower, and now the animal is usually in a state of clonic convulsions. These convulsions, however, do not always appear, their place sometimes being taken by a spasmodic rigidity of all the members, more marked in the anterior extremities, in which this state is permanent, lasting long after death. The convulsibility is soon lost after repeated irritations, and then it is only after a period of complete repose, lasting for several minutes, in which the nerve centres have time to recover, that spasms can be excited. Occasionally, after a larger dose, the frog passes immediately into a state of collapse, lying flaccid and helpless, with limbs extended, and entirely heedless of any irritation. If the chest is now opened, the heart is either found at rest in systole or else beating feebly and irregularly. It responds feebly, but rhythmically, or else not at all, to electricity, while the other muscles are more strongly irritable. If, however, the irritation be applied to the muscles, near where the hypodermic injection was given, they are found to have lost almost entirely their inherent contractility. When the various tissues and organs are examined post-mortem, there is no lesion discoverable, but intense venous congestion. In warm-blooded animals, it always, sooner or later, produces a state of collapse. When given subcutaneously, the injection causes considerable local irritation, soon followed by general uneasiness and muscular inco-ordination. When thrown into the stomach, it always causes nausea and vomiting, attended by violent retching, and even when given subcutaneously, sometimes causes emesis, and always more or less nausea. In several instances it caused purging of dark liquid stools. One of the most constant symptoms attending the exhibition of sanguinarina, is a profuse and long-continued salivation, and that, too, occurring independently of emesis. Here, as in the cold-blooded animals, a small dose causes an increase in the number and violence of the respiratory movements, followed by a diminution in their frequency and a state of heightened sensibility, attended by clonic spasms. When, however, the

dose is larger, the animal passes immediately into a state of adynamia, with marked inco-ordination of movement, dilated pupils, deep and gasping respiration, violent retching, and emesis, with aimless spasms, terminating in death. When examined post-mortem, the rigidity of the anterior extremities is not as marked as in the frog. When the chest is opened, some time after all respiratory movements have ceased, the heart is still seen beating, though slowly and feebly, and soon comes to rest in systole. No post-mortem lesion is discoverable, but venous congestion and entire cessation of intestinal peristalsis. When, however, the poison has been injected into the stomach, that organ is found in a state of congestion, with its mucous membrane red, and, in some cases, when death has not been immediate, softened from local irritation. The pupils are always dilated. Occasionally I have observed narcotic effects in the course of the poisoning, but generally subordinate to other symptoms.

Adynamia, the prominent symptom of sanguinarina poisoning, may be caused by paralysis of the motor or sensory nerves or of the muscles themselves, or it may be caused by direct action of the poison on the spinal cord; each of these modes will be studied in turn.

Nervous System. 1. *Action on Motor Nerves.*—If the poison is introduced into the circulation, and then produces general motor paralysis, the motor centres and muscles being assumed to be intact, it is evident that its action is purely localized on the motor, afferent nerves; and such being the case, if the poison can be prevented from reaching those nerves, no paralysis should ensue. This can be accomplished by the method of Bernard, which consists in ligating the bloodvessels in one extremity, so preventing the poison from acting on any of the tissues in that extremity, and then by comparing the irritability of the nerve in the ligated member, below the seat of ligature, with the irritability of the nerve on the side to which the poison has free access, it can be determined whether the function of the motor nerves has been interfered with by the poison.

Expt. VI.—Frog. Weight 28 grms. Iliac artery and veins ligated on right side. 11.15 A. M., 0.0125 grm. subcutaneously. 11.17, losing power in anterior extremities; co-ordination disappeared; clonic convulsions. 11.26, forelegs rigid. 11.38, heart beating 24 per minute. 11.50, 0.0125 grm. subcutaneously. Heart, 12 per minute. 11.55, dead. Sciatic nerves on both sides respond at 20 c. c. (Dubois-Reymond induction coil). Muscles on both sides at 28 c. Feeble movements caused by irritating spinal cord.

Expt. VII.—Frog. Weight 69 grms. Iliac artery and veins ligated on right side. 10.45 A. M., 0.024 grm. subcutaneously. 10.52, violent respirations; 60 per minute. 10.55, want of co-ordination. 10.58, does not move when touched; when placed on back is unable to turn over. 11.10, chest opened; heart beats 24 per minute. 11.40, dead. Peripheral sciatics on both sides irritable at 17 c.; muscles at 10 c.

In these it is seen that sanguinarina has no effect whatever on the motor nerves. This possible cause of paralysis and adynamia being thus excluded in this instance, it may still be explained as being due to a

paralysis of the sensory nerves, so that no irritation can be conveyed to the spinal centres, and consequently no reflex actions evoked. This theory would be more plausible if the narcotic action of this drug was more marked, as then, the influence of the cerebrum being removed, any action which followed any excitation would be an excito-motor reflex action, and irritation being prevented from reaching the cord by paralysis of the sensory nerves, the animal would be virtually paralyzed.

2. *Action on Sensory Nerves.*—I have employed several methods of studying the function of sensory nerves when sanguinarina has been given —that of Von Bezold and Blœbaum, Pflüger, and Brown-Séquard; the method which I think furnishes the most reliable results is as follows: The vessels are tied in one lower extremity of a frog, and the poison injected subcutaneously into the body. After death, or just before death, the irritability of the skin and *central* extremity of the sciatic on one side is compared with that of the other. I have shown that the motor nerves are not paralyzed, and as we for the present suppose that the ganglia are unaffected, if the sensory nerves are also unaffected the central irritability of the skin and sciatics should be equal; because, even if the spinal centres are weakened, an irritation of the skin and central end of the sciatic on one side, which would produce reflex movement on the *opposite* side, should, when applied to the opposite side, produce a similar result if the conducting power of the two sciatics remained the same. Suppose now, however, that sanguinarina should paralyze the sensory nerves, then an excitation of the skin and central sciatic on the poisoned side would cause no reflex motion on the opposite side, because the stimulation would not reach the cord, while irritation of the nerve which had not been reached by the poison, would cause motion in the opposite limb.

Expt. VIII.—Frog. Weight 69 grms. Iliac artery and veins tied on right side. 11.20, 0.025 grm. injected. 11.30, want of co-ordination, slight convulsions, rigidity of anterior limbs; does not move when pinched. 12.10, dead. Central end of both sciatics *not* irritable at 0. Peripheral ends at 20 c.

Expt. IX.—Frog. Weight 17 grms. Iliac artery and veins tied on right side. 11.30., 0.0125 grm. injected. 11.31, losing power in front legs; co-ordination gone. 11.58, heart 24 per minute. 12 M., 0.0125 grm.; heart 12 per minute. 12.5, dead. Central ends of sciatics on both sides feebly irritable at 0. Irritation of cord causes weak movements.

In these it is seen that the central ends of both sciatics are equally unirritable; irritation of the skin produces a like result. If this were due to paralyzing action on the sensory nerves, the one which was protected from the poison should have preserved its functions. This, however, is not the case; so it is probable that the paralyzing effects of sanguinarina are due to its action on the ganglia of the cord.

3. *Action on the Spinal Cord.*—That the convulsions which are produced by sanguinarina are not of cerebral origin is proved by the fact of their occurrence after the cord has been cut. This is shown in one of my

experiments on the circulation, in which the convulsions occur in a cat after the cord has been cut and no curare given.

Expt. X.—Frog. Weight 47 grms. Ablation of cerebrum at 11.25. 11.30, 0.024 grm. subcutaneously: crawls; sensation appears heightened; slight muscular quivering when touched. Irritation with acid causes convulsions. 11.45, 0.024 grm.: lower jaw relaxed; slight tetanus when touched.

Expt. XI.—Frog. Weight 19 grms. 6.4, 0.024 grm.: pupils dilated; sprawling attitude. 6.11, marked tetanus; cord cut below medulla, after which no tetanus could be evoked. Heart dead in systole at 6.20.

Here convulsions are seen after section of the cord, and although removal of the cerebrum sometimes caused the disappearance of the convulsions in animals which had previously shown them, that disappearance was probably due to the shock of the operation. It is almost impossible to study accurately the cause of the tetanus which sanguinarina causes, because even under ordinary circumstances its appearance is not constant, occurring strongly in some animals, while the same dose will kill another animal of the same size and species, in the same time, without the slightest struggle.

Expt. XII.—Frog. Weight 20 grms. Iliac artery and veins tied on left side. 10.20, 0.025 grm. subcutaneously into back. 10.25, marked tetanus in the *whole* body. 10.30, want of co-ordination. 10.35, dead.

Here it is seen that spasms appear in *all* parts of the body, even though the poisoned blood is prevented from reaching the motor nerves, the peripheral terminations of the sensory nerves, and the muscles all on one side; so that if convulsions were due to stimulation of the muscles or motor nerve endings, they should not appear in the limb from which this stimulation has been excluded. It is true that excitation of the peripheral extremities of the sensory nerves in the limb to which the poison has free access might so excite the spinal cord that it would reflexly cause convulsions in the tied limb; but that this is not the case in this instance I have proved by injecting the poison *below* the ligature, and then failing to produce convulsions. As also cerebral excitation has been excluded in Experiment X. as a cause, and as my experiments on the circulation where convulsions appeared after section of the cord excluded the possibility of their being due to irritation of any other part of the brain, the only remaining possible origin of convulsions from sanguinarina is spinal excitation.

Influence on Reflex Action.—The best method of studying reflex action is that of Türck, of Vienna. It consists in carefully removing the cerebrum of a frog by a section level with the anterior margins of the membrana tympani. When the frog has recovered from the shock, it is vertically suspended by a wire coiled around its body in such a manner as to hold its body while it leaves its lower limbs free to move. Then the reflex excitability of the spinal cord is measured by the time the frog will keep its foot immersed in a weak solution of sulphuric acid (1 gtt. to about 50 c. c. water). After each withdrawal of the foot, it should be

immersed in distilled water, so as to remove all the acid from the skin of the frog's foot. The duration of the immersion is marked by a metronome beating seconds. I give the following as examples of twenty experiments on this point:—

Expt. XIII.—Large frog. Cerebrum removed at 1.25 without bleeding. 3 P. M., r. a.[1] in 15″, 17″, 14″, 15″. 3.15, 0.008 grm. subcutaneously. 3.20, r. a. in 22″. 3.42, r. a. in 16″. 3.48, r. a. in 23″. 4.10, r. a. in 51″. 4.12, cord cut. 4.21, r. a. in 12″. 4.27, r. a. in 10″. 4.35, r. a. in 12″.

Expt. XIV.—Frog. R. T. Cerebrum removed at 1.37. 3 P. M., r. a. in 12″, 12″, 12″. 3.17, 0.008 grm. injected. 3.26, r. a. in 32″. 3.44, r. a. in 36″. 4.11, r. a. in 28″. 4.13, cord cut. 4.22, r. a. in 13″.

Expt. XV.—Green frog. Cerebrum removed at 11.18. 11.35, r. a. in 11″. 11.40, 0.0137 grm. injected. 11.45, r. a. in 21″. 11.55, r. a. in 44″. 2.15, r. a. in 28″. 3.30, cord cut. 3.50, r. a. in 10″. 4.30, r. a. in 8″.

Expt. XVI.—Frog. 12.35, ablation of cerebrum. 12.43, r. a. in 17″. 12.44, cord cut. 12.54, r. a. in 7″. 12.55, 0.023 grm. injected. 1.10, r. a. in 19″.

These, with the majority of my other experiments on this subject, show that sanguinarina decreases reflex excitability, and that section of the cord just below the medulla causes this depression to disappear, and permits the reflex excitability to approach the state in which it was before the poisoning. This can only be explained by the excitant action of the drug on Setschenow's centre (inhibitive of reflex action), because the division of the cord below the medulla removes this centre. This restoration of reflex irritability to its normal state by division of the cord would not take place if the depression was caused by an action on the cord; for when the cord was previously divided, it required a very much larger dose to produce a corresponding result. Hence the conclusion is, that sanguinarina reduces, in small doses, reflex excitability by an irritant action on Setschenow's centre. It is, however, probable that large doses depress the reflex action of the cord itself, since, when the cord is irritated in such instances at the time of death, little or no motion is evoked, though the motor nerves and muscles may be still excitable. I have only presented the above few experiments out of fifty-three others, to economize space; the others are entirely confirmatory.

Circulation.—My experiments on the circulation are fifty in number, and were made on cats, dogs, and rabbits. In a few instances I used chloroform as an anæsthetic, and although the results obtained differed in no respect from those observed in animals which had not previously been thus anæsthetized, I have omitted them on account of the similarity of action on the vascular system between sanguinarina and chloroform. The animal experimented on was placed on Czermak's holder, and the carotid artery connected with a mercurial manometer, which registered the movements of the heart on Ludwig's registering apparatus; the rate of movement of the drum was also registered by a magnet governed by Bowditch's clock, beating seconds. By a lever attached to the electro-magnet, the

[1] r. a. stands for reflex action.

beginning and end of each injection were registered, as well as the time during which a nerve was irritated. In almost all instances I injected, subcutaneously, a small amount of the sulphate of morphia to deaden sensibility during the operation. I have found that it did not interfere with the characteristic working of sanguinarina. The poison was injected through a canula, previously filled with distilled water, and bound in the external jugular vein, no air being allowed to enter. The poison was always injected towards the heart. Observations of pulse and pressure were made every consecutive fifteen seconds; when, however, there was no change in either, those portions of the experiment have been omitted. The blood-pressure is given in millimetres of mercury, the pulse for periods of fifteen seconds.

I made sixteen experiments to determine the general action of sanguinarina, of which I give the following as examples:—

Expt. I.—Cat; all the cardiac nerves intact; tracheotomy; canula in left jugular; right carotid used for observation.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
12.45.30	61	185	1. 9.15	45	70	1.18.15	54	119 S.
0.025 grm. sang. sulph.			1. 9.45	28	105 S.	1.18.30	46	90
12.46. 0	38	135	1.10. 0	36	110	1.18.45	53	70
12.46.15	25	100	1.12.30	42	95	1.19. 0	49	54
12.46.45	31	115 S.[1]	0.0125 grm. injected.			1.25.15	51	94
12.49.15	43	140	1.13. 0	43	95 S.	0.025 grm. injected.		
1. 7.30	50	110	1.13.15	47	81	1.25.30	43	90
0.0125 grm. injected.			1.14. 0	51	109 S.	1.26. 0	42	54
1. 8.45	45	95	1.18. 0	51	117	0.0125 grm. injected.		
1. 9. 0	28	88	0.025 grm. injected.			1.27.45	33	39

Observation suspended. Dead at 1.30.

Expt. II.—Rabbit; same conditions as preceding.

Time.	Pulse.	Pressure	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
10.49. 0	37	122	11.0. 0	37	108	11.19. 0	46	101
0.0125 grm. sang. sulph.			11.1.15	31	110	0.025 grm. sang. sulph.		
10.49.30	24	120 S.	0.0125 grm. sang. sulph.			11.19.15	35	90 S.
10.49.45	35	112	11.1.45	24	112 S.	11.19.45	38	67 S.
10.50. 0	48	110	11.2. 0	29	117	11.20. 0	39	41
10.51.30	40	109	11.2.15	30	130	11.20.15	40	20

Heart dead at 11.20.45.

Expt. III.—Cat; same conditions as preceding.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
2.12.45	45	142	2.13.15	34	90	2.16.15	51	73
0.025 grm. sang. sulph.			2.13.30	30	71	2.17.15	46	70
2.13. 0	41	137	2.14. 0	40	118 S.			

Observation suspended.

Expt. IV.—Small cat; same conditions as preceding.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
11.50.30	59	123	11.51.45	66	56	11.59. 0	43	30
0.025 grm. sang. sulph.			11.58.45	54	44	11.59.30	44	8
11.51. 0	45	76 S.	0.025 grm. sang. sulph.			12. 0. 0	49	10

Observation suspended. Dead at 12.30.

[1] Struggling.

Expt. V.—Cat; same conditions as preceding.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
2.0.45	38	155	2. 4.15	22	153	0.0125 grm. sang. sulph.		
0.0125 grm. sang. sulph.			2. 6.30	18	121	2.24. 0	18	97
2.1.15	48	173 S.	2. 6.45	17	111	2.24.15	25	124 S.
2.1.30	43	180	2. 9.15	21	84	2.24.30	22	147
2.2.45	33	172	2.23.30	15	75	2.25. 0	26	172

Observation suspended.

It may be noticed in the preceding experiments that there is always, sooner or later, a decided fall of blood tension and a considerable slowing of the pulse, this condition being produced immediately by a large dose, usually followed by a rise of both, while after smaller doses have been given, the rise appears first. It will be further noticed that in almost all the instances in which a fall occurs first, followed by a rise, that rise is accompanied by struggling. It remains to be determined what is the relation between the struggling and the increased blood-tension. Is the struggling the cause of *both* the increased pressure and pulse, or does the high blood-tension cause struggling, and consequently a more rapid heart's action? In other words, what elements of these observed facts are due to sanguinarina directly, and what to the struggling which it causes? It is well known that violent muscular movements will increase the rapidity of the heart's action, but as to whether the struggling is the cause of the augmented blood-pressure directly, or *vice versa*, remains to be seen. This can be determined by excluding the possibility of struggling by curare; if now a rise of blood-pressure or of the heart's action occur, that result must be due to the sanguinarina directly. In my experiments where curare was used, artificial respiration similar to normal was kept up by an apparatus on the principle of Sprengel's blower, the current of air being broken at regular intervals by a metronome and electro-magnet. I made ten experiments under curare to discover the general action of sanguinarina. They all gave similar results. In each experiment merely enough curare was given to prevent respiration, usually about 1 c. c. of a 1 per cent. solution, and in all cases it was injected into the jugular and towards the heart.

Expt. VI.—Very small cat; all the cardiac nerves intact; tracheotomy; curare; artificial respiration; canula in left jugular; observation in carotid.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
12.45.15	60	88	0.0125 grm. sang. sulph.			1.0.15	50	70
0.00625 grm. sang. sulph.			12.53.45	55	57	1.0.30	49	56
12.45.30	61	93	12.54.45	57	96	1.0.45	48	51
12.46.15	60	135	12.55. 0	56	120	1.1.30	49	45
12.47. 0	59	117	0.025 grm. sang. sulph.			1.4.30	47	63
12.47.15	58	102	12.55.30	59	75	0.025 grm. sang. sulph.		
12.47.45	57	84	12.55.45	50	57	1.5.15	43	80
12.48.15	55	70	12.57. 0	50	48	1.5.45	45	75
12.48.45	57	67	1. 0. 0	51	74	1.6.30	45	60
12.49.15	55	61	0.025 grm. sang. sulph.			1.7.15	45	55

Observation suspended. Dead at 1.9.

Expt. VII.—Cat; same conditions as preceding.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
12.30.30	32	140	12.31.15	44	82	12.32. 0	32	46
0.1 grm. sang. sulph.			0.05 grm. sang. sulph.			12.32.15	31	40
12.30.45	31	130	12.31.30	38	52			
12.31. 0	46	125	12.31.45	34	47			

Observation suspended. Heart dead at 12.34.0.

In Experiment VI., it is seen that in a very small cat under curare, a proportionately small dose of sanguinarina causes a rise in blood tension, followed by a fall, while the pulse steadily decreases in rapidity. Again, a second larger dose causes a fall of both pulse and pressure, unaccompanied by any rise. In Experiment VII., very large and repeated doses caused great and instantaneous fall of pressure, while the pulse is not as much affected. By these observations we can account for the variations observed in those instances where no curare was given. In the first place, it is seen that the secondary rise which occurred after a large dose of sanguinarina, and which was always accompanied by struggling, as in Experiment I., was really due to that struggling, because when curare prevented struggling, no such rise appeared. In the same manner the increase in the pulse can be accounted for, as it only appeared in those experiments where no curare was used, and even then only when accompanied by struggling, while after curare has been given, the pulse always falls, because struggling, its exciting cause, has been removed. As, even when the animal is curarized, there appears in certain instances a rise in blood tension, it is evident that in *every* instance in which a rise appeared when no curare had been given, that rise could not have been due to struggling; there must be some additional cause. It will be seen that every time a rise occurred in animals which had been curarized, it was after a *small* dose had been given and usually early in the experiment, the same dose, possibly, when repeated, causing a fall. Now, this is only what might be expected from our knowledge of the action of other poisons. Almost every toxic agent (*e. g.* fever poison), which produces its results by a paralysis of any tissue or organ, produces an initial stage of irritation of that tissue or organ, and this stage of irritation is more marked after small doses than after large. So also with sanguinarina; it may reduce blood pressure by paralysis of the vaso-motor system, or of the heart, while irritation of either of these organs will cause a rise, and if what I have stated is true, it is rational to expect that the paralysis of either of these nervous centres would be preceded by a stage of irritation. This is still further rendered probable from the circumstances under which the rise occurs in this case; it is only, in curarized animals, after the administration of small doses, and is even then soon followed by a fall, while large doses cause immediate paralysis either of the heart or vaso-motor system, and therefore an immediate fall. So, then, it is probable that sanguinarina in small doses causes a rise in blood pressure by the irritation of those nervous centres through whose paralysis

its subsequent fall is effected. I have already proved that the struggling is of spinal origin. I have proved now that the general action of sanguinarina on the circulation is to reduce the frequency of the pulse, and to diminish blood tension; it now remains to be seen through what nervous agency these results may be obtained. The circulation is influenced by the irritation or paralysis of various nervous apparatus. Prominently, the pulse may be reduced through central or peripheral irritation of the pneumogastrics, or by directly acting on the ganglia of the heart; the blood pressure may be reduced by paralysis of the vaso-motor system, or by debility of the cardiac ganglia. We will study these in turn.

I. *Action on the Pneumogastrics.*—It is evident that a condition of irritation or of paralysis of these nerves must exist if they are affected by the action of sanguinarina.

Expt. VIII.—Rabbit; vagi prepared; tracheotomy; canula in left jugular; right carotid used for observation.

Time.	Pulse.	Pres.	Remarks.
3.14.45	72	84	
3.15. 0	64	86	0.025 grm. sang. sulph.
3.15.15	51	86	Struggling.
3.15.30	67	88	"
3.15.45	73	67	
3.16. 0	75	68	
3.16.15	61	60	Vagus irritated 5″. Weak induction current.
3.16.30	71	57	
3.16.45	74	56	
3.17. 0	74	56	

Observation suspended.

Expt. IX.—Cat; same conditions as preceding; curare; artificial respiration, etc.

Time.	Pulse.	Pres	Remarks.
10.35.15	55	80	
10.35.30	56	79	0.0125 grm. sang. sulph.
10.35.45	54	106	
10.36. 0	53	150	
10.38.30	54	125	
10.39.15	52	105	
10.39.30	41	116	Vagus irritated 15″. Weak induction current.
10.39.45	46	103	
10.40. 0	51	86	
10.46.15	50	88	
10.46.30	31	68	Vagus irritated 9″. Stronger current.
10.46.45	41	56	
10.48.15	51	60	0.025 grm. sang. sulph.
10.55.15	44	40	
10.55.30	32	40	Vagus irritated 9″.
10.55.45	39	36	0.05 grm. sang. sulph.
11.10.30	45	40	
11.10.45	40	42	Vagus irritated 15″.
11.11. 0	45	40	

Observation suspended.

These experiments prove the vagi nerves are not paralyzed by sanguinarina. It is next to be determined whether the reduction in the pulse which is caused by sanguinarina is due to its irritant effects on these nerves, and if so, whether through irritation of their peripheral or central terminations. Here, again, a process of exclusion is necessary. By the administration of a small dose of the sulphate of atropia, it is possible to paralyze the cardiac extremities of the pneumogastrics without interfering with the functions of any other nerve; if, now, in such a case, sanguinarina still slows the pulse, it evidently cannot be through irritation of the periph-

eral ends of these nerves, for they are already paralyzed by atropia. The following experiments will decide this point.

Expt. X.—Large cat; vagi paralyzed with atropia, as tested with strong induction currents, tracheotomy, etc. etc.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
2.19.30	63	200	3.20.30	54	128	3.2. 0	44	87
0.05 grm. sang. sulph.			3. 1.15	57	163	3.2.45	39	53
2.19.45	57	178 S.	0.05 grm. sang. sulph.			3.3.15	35	57
2.20. 0	62	163	3. 1.30	52	127			

Observation suspended.

Expt. XI.—Cat; same conditions as preceding; curare, etc. etc.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
4.18.15	61	165	4.19.30	56	200	0.025 grm. sang. sulph.		
0.0125 grm. sang. sulph.			4.20. 0	53	176	4.31.0	51	110
4.18.30	56	158	4.24. 0	55	162			

Observation suspended.

By these it is proved that sanguinarina does not slow the heart by stimulation of the peripheral ends of the pneumogastrics. To determine whether the poison acts on the central ends of the vagi, all that is necessary is to divide both these nerves in the neck, when of course all possibility of central irritation affecting the heart is excluded.

Expt. XII.—Rabbit; vagi cut; curare; artificial respiration, etc. etc.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
12.14. 0	58	95	12.14.45	52	125	0.0125 grm. sang. sulph.		
0.025 grm. sang. sulph.			12.15.15	57	83	12.19.45	50	43
12.14.30	55	115	12.19. 0	53	57	12.20.30	39	29

Heart dead 12.30

Expt. XIII.—Rabbit; same conditions as preceding.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
1.30.45	58	102	1.35.45	60	74	1.37.15	33	33
0.025 grm. sang. sulph.			0.0125 grm. sang. sulph.			1.37.45	27	28
1.31.15	49	106	1.36.15	52	70	1.38. 0	26	27
1.32. 0	58	98	1.36.30	51	55			
1.33. 0	60	71	1.37. 0	39	30			

Observation suspended. Heart dead at 1.40.

I have made ten experiments under this head, and in all of them there was marked reduction in the pulse. Expt. XIII. is the only one in which the rapidity of the heart's action ever exceeded normal, and even there it is very slight and transient. In all the experiments so far, the conclusions as regards general action still hold. I have proved the pneumogastrics are not paralyzed by sanguinarina, and I have proved that its characteristic action on the pulse and pressure are not due either to central or peripheral excitation of these nerves; consequently the cardio-inhibitory functions of the vagi are not interfered with by this poison, so the pulse must be reduced by action on the heart itself. Leaving for the present the study of the pulse, I will next endeavour to ascertain through what agency sanguinarina produces its reduction in blood tension. As I

have stated, it may be due to paralysis of the vaso-motor apparatus or of the heart itself. We will study these in turn.

II. *Action on Vaso-motor System.*—The action of the vaso-motor system upon the circulation is purely reflex; when its influence is interfered with, and the intensity of its action diminished, this effect may be produced in three ways: 1st. By loss of function of the afferent, the sensory nerves. 2d. By diminished tonus of the vaso-motor centre itself, etc. 3d. By loss of function of the efferent vaso-motor fibres. We will study these in turn.

1. One of the most constant effects of the irritation of a sensory nerve is a rise in blood pressure, caused by reflex irritation of the vaso-motor centre. I have already shown that the conductive power of the sensory nerves is not interfered with by this poison as regards conduction of sensations; we will see whether the afferent vaso-motor fibres are interfered with; whether this rise can be produced when the animal is under sanguinarina.

Expt. XIV.—Small cat; vagi cut; tracheotomy; curare; artificial respiration, etc. etc. Sciatic prepared.

Time.	Pulse.	Pres.	Remarks.
11.30.45	56	100	
11.31. 0	55	87	0.05 grm. sang. sulph.
11.32. 0	52	53	
11.38. 0	53	96	
11.38.45	55	100	
11.39. 0	55	105	Sciatic irritated 9″, coil at ix.
11.39.15	53	101	
11.49.30	55	86	
11.49.45	55	89	Sciatic irritated 7″, coil at iv.
11.50. 0	56	87	0.05 grm. sang. sulph.
11.52. 0	42	52	
11.52.15	41	50	
11.52.30	40	51	Sciatic irritated 18″, coil at iv.
11.52.45	41	50	

Observation suspended.

From this it is evident that the tonus of the vaso-motor centre is very much diminished to indirect irritation, a rise of only a few millimetres following a prolonged irritation with a strong current. Now, this may be due to paralysis of the afferent vaso-motor fibres, but as I have shown the sensory nerves are not paralyzed, it will be rational to conclude these vaso-motor fibres are not affected, especially if the vaso-motor centre is paralyzed to direct irritation.

2. This can be determined by several methods. One is to screw one of Ludwig's gimlet electrodes into the occiput, and the other into the atlas, when an electric current will directly irritate the vaso-motor centre itself. The afferent and efferent cardiac nerves in the neck must be cut to prevent extension of the current and implication of the other cardiac apparatus. I have made five of these experiments.

Expt. XV.—Cat; all the cardiac nerves in the neck cut. Sciatic prepared; Ludwig's electrodes in occiput and atlas; tracheotomy; curare, etc. etc.

Time.	Pulse.	Pres.	Remarks.
4.17.15	69	135	
4.17.30	67	130	0.025 grm. sang. sulph.
4.18. 0	64	100	
4.19. 0	63	73	
4.21.15	66	76	
4.21.30	66	75	Sciatic irritated 11″, coil at x.
4.21.45	65	76	
4.23.15	68	79	
4.23.30	66	75	Centre irritated 10″, coil at x.
4.23.45	66	77	
4.26.30	65	83	0.0375 grm. sang. sulph.
4.30.15	58	43	
4.30.30	59	42	Centre irritated 9″, coil at v.
4.30.45	57	41	
4.37.15	54	28	
4.37.30	55	29	Centre irritated 13″, coil at v.
4.37.45	55	29	
4.39. 0	54	25	
4.39.15	52	25	Centre irritated 12″, coil at 0.
4.39.30	53	25	

Here it is seen that the vaso-motor centre is completely paralyzed to direct irritation, no rise following prolonged irritation with strong currents: in some cases I found the pulse quickened after these irritations, this was probably caused by the transmission of the current to the accelerator nerves which arise in the brain, and pass down the cord to the heart. Another method of applying direct irritation has been shown by Nawalichin (*Centralblatt*, 483): he has found that in curarized animals with divided vagi and sympathetics, ligation of both carotids causes a quickened pulse, and an increase of 60 per cent. in the blood pressure. This rise is due to irritation of the vaso-motor centres from diminished blood supply; this is proved by the fact that it does not appear after the cord has been divided. We will now see if a rise can be produced in this manner after sanguinarina has been given. The animal is prepared as in preceding experiments, the crural artery being connected with the manometer, while the carotids are loosely encircled with threads; by raising these simultaneously, the circulation in these vessels is arrested for the time, and anæmia of the vaso-motor centre occurs.

Expt. XVI.—Cat; carotids prepared; curare, etc. etc.

Time.	Pulse.	Pres.	Remarks.
12.14.15	64	150	
12.15. 0	66	168	Carotid compr'd 7″.
12.15.15	67	164	0.025 grm. sang. sulph.
12.16.30	51	95	
11.21. 0	41	93	
12.21.15	49	108	0.025 grm. sang. sulph.
12.23.45	59	140	
12.24. 0	61	155	Carotid compr'd 6″, 0.025 grm. sang. sulph.
12.45. 0	58	46	
12.45.15	59	46	Carotid compr'd 7″.
12.45.30	60	46	

Expt. XVII.—Cat; same condition as preceding.

Time.	Pulse.	Pres.	Remarks.
1.3.45	50	87	
1.4. 0	46	101	Carotid compr'd 23″.
1.4.15	39	90	
1.4.45	50	70	0.025 grm. sang. sulph.
			Observation suspended.
			0.05 grm. sang. sulph.
1.15.30	39	62	
1.15.45	40	62	Carotid compr'd 34″.
1.16. 0	40	62	

Here it is seen that compression of the carotids caused a considerable rise in blood tension, but after sanguinarina had been given, irritation of

the centre by anæmia thus produced had no effect, except in one instance, which occurred when high tension had already been produced by a small dose. This fact goes to prove the statement already made that this initial rise is due to irritation of the vaso-motor centre, while now by two methods I have proved that the vaso-motor centre is paralyzed by large doses of this drug, so accounting for the low pressure which it then produces. There is a third method. Ludwig and Cyon, the discoverers of the "depressor" nerves, stated that they produced their characteristic action by paralyzing the vaso-motor centre. When the central end of one of these nerves is irritated (the vagi being divided), the blood pressure is greatly reduced without interfering with the pulse; this is caused, not by any action on the heart, but by a dilatation of the bloodvessels, produced by the reflex inhibitive or paralyzing action which this nerve, when irritated, exerts over the vaso-motor centre. If now this centre be already paralyzed by sanguinarina, the low tension ensuing from this cannot be further reduced by irritation of the depressor.

Expt. XVIII.—Small cat; depressor prepared; vagi cut; curare, etc. etc.

Time.	Pulse.	Pres.	Remarks.
11.5.65	62	85	
11.5.30	63	60	Depressor irritated 15″, coil at iii.
11.7.30	55	67	0.024 grm. sang. sulph.
11.9. 0	52	30	

Time.	Pulse.	Pres.	Remarks.
11.11.15	52	25	
11.11.30	52	25	Depressor irritated 15″, coil at iii.
11.11.45	50	25	
11.12.15	49	24	Depressor irritated 28″, coil at 0.
11.12.20	51	24	

Observation closed.

I have made two such experiments, which furnished similar results; irritation of the depressor normally caused a fall of pressure, but after a low blood-tension had been already produced, irritation of the depressor had no effect. I have now proved that the centre does not respond to either direct or indirect irritation after sanguinarina has been given. Since, now, the reflex action of the vaso-motor centre is evidently interfered with by this poison, we must look for the cause in the paralysis of the afferent or efferent nerves, or of the centre itself. Evidently the fault does not lie with the sensory nerves, for I have proved they retain their functions, and the same effect is observed after direct as well as indirect irritation of the centre. The following experiment has been made to determine whether the functions of the efferent vaso-motor fibres still remain:—

Expt. XIX.—A rabbit was placed on Czermak's holder, and the vessels of the ear auricle found normal; 0.05 grm. sang. sulph. injected into external jugular; soon the auricular vessels became much plainer. Then the cervical sympathetic was divided, when a more marked dilatation ensued; the pupil on the same side now measured 3 mm. The central end of the sympathetic was then irritated, coil at 0, when the vessels immediately contracted, and the pupil measured 10 mm.

3. Here it is evident that the efferent vaso-motor nerves are not paralyzed by sanguinarina. If, therefore, both the afferent and efferent nerves are

still intact, and sanguinarina prevents a rise of pressure under direct and indirect irritation of the vaso-motor centre, it is evident this drug causes a state of diminished tonus of that centre. Now, as paralysis of the vaso-motor centre is an important element in producing low arterial pressure, from the consequent dilatation of the vessels, so here we have one cause for the low blood-tension which sanguinarina produces.

III. *Action on the Muscular Structure of the Heart or its contained Ganglia.*—In order to confine the action of a drug to the heart it is necessary to remove all influence of the cerebro-spinal system; this is accomplished by dividing all the afferent and efferent cardiac nerves, and by removing the influence of the vaso-motor centre and accelerator nerve by section of the cord.

Expt. XX.—Cat; vagi, sympathetics, and depressor nerves divided; cord cut between occiput and atlas (verified by post-mortem examination); bleeding checked with bovista; tracheotomy; artificial respiration; canula in left jugular; right carotid used for observation.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
1.3. 0	51	45	1. 7. 0	49	49 S.	0.05 grm. sang. sulph.		
0.025 grm. sang. sulph.			1. 8. 0	49	30	1.19.30	48	46 S.
1.3.15	51	41	1.13. 0	48	25	1.20. 0	46	31
1.3.30	50	39 S.	1.14.15	48	41 S.	1.20.30	45	38 S.
1.4. 0	49	34	0.025 grm. sang. sulph.			1.21.30	44	33
1.4.30	47	30	1.15.15	50	28	1.26.30	40	21
1.5. 0	46	28	1.15.45	46	47 S.			
1.6.30	47	27 S.	1.16.45	45	25			

Observation suspended.

Expt. XXI.—Cat; same conditions as preceding. Curare, etc.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
11.37.15	40	32	11.38. 0	38	32	11.39. 0	30	18
0.025 grm. sang. sulph.			11.38.15	38	34	11.39.15	22	15
11.37.30	31	35	11.38.30	35	23			
11.37.45	39	40	11.38.45	34	20			

Heart dead at 11.40.

Expt. XXII.—Cat; same conditions as preceding.

Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.	Time.	Pulse.	Pressure.
12.38.15	69	60	12.39. 0	58	43	12.40. 0	50	21[1]
0.0125 grm. sang. sulph.			12.39.15	56	30	12.40.15	47	19
12.38.30	69	55	12.39.30	55	20	12.41. 0	30	10
12.38.45	61	48	12.39.45	53	23	12.41.45	23	4

Here again the same sequence of results is observed with the cord and cervical cardiac nerves cut as in the general experiments when all were intact, viz., fall of pulse and pressure after all doses, in one instance the fall of pressure being preceded by a slight rise. In Expt. XXII. it is seen that irritation of the sciatic is followed by no rise. Here also it is seen that when no curare is given, muscular movements interfere with the steady fall of pulse and pressure; this fact also proves that the convulsions are of spinal origin. From all these experiments we are prepared to conclude, in accordance with the present state of physiology, that the pulse is

[1] Sciatic irritated 12″, coil at 0.

reduced by the action of this poison on the heart alone, while pressure is reduced by paralysis of the vaso-motor centre and by action on the heart. The character of that action on the heart we will now study. We have seen the introduction of sanguinarina into the circulation followed by progressive difficulty in the movement of the heart; but is that difficulty due to the direct action of the poison on the heart—is sanguinarina a true "heart poison?" By these agents are meant those drugs whose principal and primitive effect is a notable enfeeblement of the heart, and which have the power of arresting those movements, and thereby determining the death of the animal, even though the other functions are still executed. This is the strict meaning of this term, but it is evident that such a limitation is practically impossible, as all of the so-called cardiac poisons interrupt the action of the heart in the midst of other functional troubles more or less apparent. But even with this allowance sanguinarina is not strictly a heart poison, because, as I shall show, it kills by preventing respiration, and some time after the animal has ceased to breathe the heart continues to beat. If, however, artificial respiration is kept up, then this drug is a true heart poison. I have studied the action of this poison on the heart chiefly in frogs, because in them it is easy to lay the heart bare without endangering their lives, and because under these circumstances the heart can be kept under observation for many hours. When a dose proportionate to the size of the animal is given hypodermically, there may occasionally be noticed a slight acceleration of the heart; but this soon disappears, and the heart now beats markedly slow and irregular. The ventricular systoles become partial and incomplete, and sometimes the systole of the ventricle is preceded by two auricular contractions; then, after a variable time, dependent upon the dose and the size of the animal, the ventricle ceases to contract, and recoils upon itself, and remains immobile in a condition of systole; it is yellowish-white and absolutely free from blood. The rhythmical movements of the auricles may continue for a few moments, but they visibly become weaker, and soon become distended with blood. They then cease to contract, and remain forcibly dilated and gorged with black blood, contrasting strongly with the ventricles, which are, as I have said, pale and contracted. Up to this time, occasionally, the frog has not lost completely the vivacity and energy of its movements, and, if loosed, will jump with vigour, even though its heart no longer beats. The muscles are not long, however, in losing their power; their contractility diminishes little by little. This loss of power is not due to the mere withdrawal of the circulation, for a frog in whom all the vessels are ligated as they leave the heart, will retain its muscular contractility long after the muscles are completely inactive in a frog of the same size and species which was poisoned with sanguinarina at the time of ligature of the vessels of the other. This fact shows this drug must have some action on muscular structure. These effects of san-

guinarina on the heart may be explained through action on the inherent cardiac ganglia, or by affecting the cardiac muscular tissue. I think I have proved the cardiac afferent and efferent nerves are unaffected by this poison, and as these nerves are in the main influenced by the same agents which act on the ganglia, it might be reasonable to suppose that the ganglia, in this instance at least, were not implicated, and as this poison interferes with the action of other striated muscles, it would be only natural to imagine it acted on the muscular tissue of the heart. If the contractility of the cardiac muscle of a frog is examined, in whom the movements of this organ are just about to be arrested by sanguinarina, it is found that it is already much diminished; excitation of the auricular tissue by means of a faradic current only awakens feeble contraction, and a few minutes later the same current has no effect. Then, too, the local administration of sanguinarina greatly slows and ultimately stops the heart's action, both when the heart is excised and placed in a solution of the poison and when a few drops are placed within the pericardium, the heart remaining *in situ*. Then, too, I have demonstrated to my own satisfaction, by tracings obtained by a lever attached to the heart's apex, that the cardiac contractions under this poison become absolutely more feeble. Although of course it is impossible absolutely to demonstrate that sanguinarina paralyzes the muscular structure of the heart and leaves its ganglia intact, I think it probable that such is the case. For I have shown the cardiac nerves are untouched by this poison, and all those poisons whose action is claimed to be on the cardiac ganglia, certainly act on these nerves also, and so, more by analogy than by anything else, the ganglia are said to be affected. Now, if such a line of argument holds in the case of the other poisons, the same principle should be accepted here. Sanguinarina does not act on any of the cardiac nerves, and does act on all the muscles; so here I think it reasonable to conclude that it produces its typical effects by action on the muscular tissue of the heart. Besides, as long as the heart responds to electric excitation, it responds rhythmically, and this would not be the case if the ganglionic system was affected.

Respiration.—According to the physiology of respiration, as at present taught, any modifications in character, frequency, duration, or rhythm which occur in the respiratory movements must be due to the action of the poison on the pneumogastrics or on the respiratory centre, the possibility of the efferent respiratory nerves being affected by the drug in question, having already been excluded by the experiments in which I proved that the motor nerves were not implicated. By the same series of experiments, it is also rendered improbable that the other afferent nerves, the sensory nerves, are at all concerned. So then, the modes of action remaining possible are by the trunks of the vagus and the respiratory centre. Therefore my experiments, to prove anything, must exclude one of these possibilities. It is evident that it will be impossible to remove the influence of the respiratory

centre, but by dividing the vagi, any impression made upon these nerves, whether an abolishment or exaggeration of function, will be prevented from affecting the respiratory centre. For example, suppose sanguinarina caused an irritation of the vagi; now, inasmuch as these nerves are mere conductors of impression, are afferent sensory nerves, that irritation can produce no result if it is prevented from reaching the respiratory centre. Again, on the other hand, if the pneumogastrics are paralyzed by this substance, the only result which would appear would be merely similar to that obtained by section of these nerves. We will now examine into the action of sanguinarina on the respiratory apparatus. I have made ten experiments, of which I give the following:—

Expt. I.—Cat; all respiratory nerves intact; tracheotomy; canula in left jugular; trachea connected with Marey's tympanum; registering on Ludwig's registering apparatus.

Time.	Resp.	Remarks.
11.27.15	32	
11.27.30	24	.02 grm. sang. sulph.
11.27.45	12	
11.28. 0	11	
11.29. 0	10	
11.30. 0	6	
11.37. 0	11	
11.40.15	15	0.024 grm.
11.40.30	9	Pause after expiration becoming prolonged.
11.40.45	6	
11.43. 0	5	Struggling.
11.52.45	4	
12. 1.45	8	0.024 grm.
12. 2.15	3	
12.20.30	1	Counted in periods of 30″.
12.22. 0	1	
12.24. 0	1	Counted in periods of 60″.
12.26. 0	2	Pause very much lengthened, lasting 57″; respiratory movements only 3″.
12.30. 0	1	
12.35. 0	2	
		0.025 grm. sang. sulph. Respiration gradually becoming shorter and shallower until 12.35.0. Dead. Chest opened. Heart 22 in 15″.

Expt. II.—Rabbit; same conditions as preceding.

Time.	Resp.	Remarks.
12.35. 0	10	
12.35.15	17	0.0125 grm.
12.35.30	28	Struggling.
12.36. 0	30	
12.49. 0	17	0.025 grm.
12.49.30	16	
12.50. 0	20	Struggling.
12.50.45	11	Pause becoming lengthened.
12.52. 0	9	
12.53. 0	7	Spasmodic respiration.
12.53.30	3	
1. 5. 0	2	Respiration now counted in periods of 60″.
1. 6. 0	1	
1. 7. 0	2	
1. 8. 0	1	
1. 9. 0	3	Respiration ceased; chest opened; heart beating irregularly. Ventricle 48 per min. Auricles 123 " "

In these observations it is seen that sanguinarina causes slowing of the respiratory movements; after small doses have been given, there is sometimes noticed an increase in their number, which increase, however, is usually accompanied by convulsions, so it cannot positively be decided whether they are both effects of the same cause, or whether the struggling causes the increased rapidity of respiration. Here curare is of no use. It is also noticed that respiration is slowed, not so much by any alteration in duration of expiration or inspiration, as by lengthening the pause which follows expiration. This fact seems to point at increasing loss of tonus of

the respiratory centre. Sometimes I have noticed a peculiar halt in the middle of the expiratory movement, similar to that which often appears after section of the vagi when no poison has been given.

Expt. III.—Small cat; vagi cut; tracheotomy, etc.

Time.	Resp.	Remarks.	Time.	Resp.	Remarks.
12.40.15	5		12.55.45	7	Spasmodic respiration.
12.40.30	6	0.06 grm. injected.	12.56. 0	5	Expiratory pause prolonged.
12.40.45	1				
12.41. 0	2		12.57. 0	2	
12.43. 0	2		12.58. 0	3	
12.44. 0	3		12.59. 0	3	
12.55. 0	4		12.59.30	2	
12.55.30	0	0.6 grm.	12.59.45	1	Dead.

Heart 48 per minute.

Here, also, the same results are produced—respiratory movements slowed by lengthening the pause after expiration. Now, of course, this could not be due to any irritation of the respiratory fibres of the pneumogastric, for the same results appear after section of these nerves. It is probable it is not due to irritation of the superior laryngeal nerve, for when death is produced through excitation of this nerve, the diaphragm is in a condition of relaxation; such a state does not exist here. The animal dies slowly and gradually, respiration being slowly arrested by progressive lengthening of the expiratory pause, all the muscles, as far as I have been able to observe, being generally relaxed. These results cannot be due to paralysis of the vagi, as they appear after section of these nerves. Hence, sanguinarina is a respiratory poison, which causes death through paralysis of the respiratory centre, while the heart still beats after all respiratory movements have ceased.

Muscular System.—Weyland (*Beiträge zür Anat. u. Phys.*, Funf. B. erst. H., p. 55) and Harnack (*Archiv für Exper. Path. u. Pharm.*, Bd. iii., p. 44) have both noticed that sanguinarina, when applied locally, interferes with muscular contractility, but neither of these observers states what irritant they used, so no idea can be formed of the strength of excitation which the muscles received. I have already stated what my instruments of excitation were. In my experiments, which were ten in number, I dissected out the gastrocnemius from each leg of a frog; one was placed in a watch glass containing distilled water, the other in a neutral solution of the sulphate of sanguinarina, 1 c. c. = .025 grm. Irritation was applied directly to the muscular tissue. "S" stands for sound muscle; "P" stands for poisoned muscle. The figures represent the separation of the secondary from the primary coil, Dubois Reymond instrument.

Expt. I.—1.35, s. at 13 c.; p. at 13 c. 1.40, s. at 13 c.; p. at 9 c. 1.45, s. at 9 c.; p. at 5½ c. 1.50, s. at $7\frac{5}{10}$ c.; p. at 2 c. 1.58, s. at 7 c.; p. not at 0 c. 2.50, s. at 6.5 c. 4.50, s. at 0.

Expt. II.—10.45, s. at 27 c.; p. at 27 c. 10.47, s. at 27 c.; p. at 23 c. 10.50, s. at 27 c.; p. at 21 c. 13.55, s. at 27 c.; p. at 12. 10.57, s. at 27 c.; p. at 9 c. 11, s. at 27 c.; p. at 3. 11.10, s. at 27 c.; p. not at 0.

Expt. III.—11.15, s. at 27 c.; p. at 27 c. 11.18, s. at 27 c.; p. at 22 c. 11.23, s. at 27 c.; p. at 15 c. 11.28, s. at 27 c.; p. at 8 c. 11.36, s. at 27 c.; p. not at 0.

In these it is seen that the muscles which were placed in a solution of sanguinarina entirely lost their contractility in a few minutes, while those which were placed in water retained their contractility usually for several hours. This must be due to the specific action of the drug. As regards the action of this drug when introduced into the circulation, it undoubtedly does diminish their contractility as Harnack has asserted, for the muscles of a frog killed by sanguinarina are much less irritable than those of a frog killed by some other means. This is a rough mode of investigation, and when the blood is prevented from reaching the muscles of one extremity, the contractility in that limb is very little if at all greater than in that limb which has received the poison. It is possible, however, that this may be due to the physical imbibition of the poison into the tissues which had been protected by the ligature. The only variation from the normal curve of muscular contraction produced by sanguinarina is a diminution in intensity of contraction, rendering the ordinates of the curve shorter. This is due to the progressive paralysis of the muscle, and confirms my other experiments on this subject. In studying the muscle curve, I used Marey's comparative myograph, and Foucault's regulator, in the manner laid down by him in his work.

Temperature.—

Expt. I.—Cat.

Time.	Temp.	Remarks.
12.34	Thermometer inserted into rectum	
12.39	40.7° C.	A small amount of morphia was given, and after its effects had appeared the pupil measured 9 mm.
12.40	....	0.0125 grm. into femoral vein.
12.43	40.8	Retching; pupils measured 12 mm.
12.47	40.7	Spasmodic movement of head.
12.49	40.6	
12.53	40.5	
12.55	40.4	
12.57	40.6	Convulsions.
12.59	40.2	
1. 2	40.2	
1. 3	40 1/5	
1. 5	40	
1. 7	33.9	
1. 9	39.8	
1.11	39.7	Struggling.
1.18	39.6	
1.28	39.5	
1.35	39.5	0.0125 grm. sang. sulph.
1.36	39.6	Struggling.
1.39	39.7	Pupils not sensitive to light.
1.50	39.6	0.025 grm. sang. sulph.
1.53	39.5	
1.56	39.4	0.0125 grm. sang. sulph.
2. 7	39.1	Slight convulsions.
2.17	38.9	Respiration ceased. Heart beating feebly.

Expt. II.—Cat.

Time.	Temp.	Remarks.
1.55	39.8	0.0375 grm. sang. sulph.
1.58	39.6	Struggling.
2.	39.4	
2. 5	39.2	
2. 6	39.	
2. 8	38.8	
2.12	38.6	0.0375 grm. sang. sulph.
2.16	38.	
2.18	37 8	
2.22	37.4	0.0375 grm. sang. sulph.
2.28	36.8	
2.37	36.	Respiration ceased.

Heart beating 25 times in 15″; vagus has still inhibitory power over heart; no peristaltic movement: pupils dilated; section of cervical sympathetic, as well as irritation, both before and after section; coil at 0; produced no alteration in size of pupil; oculo-motor nerve not irritable; coil at 0.

I have made ten such experiments, in all of which this marked fall appeared.

Glandular System.—I have studied the action of this drug on the liver in several experiments. I used a modification of Röhrig's method, proposed by Rutherford and Vignal, but without noticing any change in the quantity or quality of bile. The salivation which this drug produces is of such constant occurrence under all circumstances, that it is probably a specific action of the drug on the salivary glands, but my time has not permitted me to investigate it.

From 153 experiments made with this alkaloid on cats, dogs, rabbits, frogs, guinea-pigs, pigeons, etc., I have drawn the following conclusions:—

1. Sanguinarina destroys life through paralysis of the respiratory centre.

2. It causes clonic convulsions of spinal origin.

3. It has no effect on either the motor or sensory nerves.

4. It causes marked adynamia and prostration from its depressing action on the spinal ganglia and muscles.

5. It decreases reflex excitability through irritation of Setschenow's centre, and by ultimate paralysis of the spinal ganglia, from large doses.

6. It produces in cats, dogs, and rabbits, a fall of pulse and blood pressure, the fall of the latter being preceded by a temporary rise after the administration of proportionately small doses.

7. The fall of blood tension is caused by a paralysis of the vaso-motor centre, and by a paralysis of the heart itself, probably of its muscular structure.

8. The temporary rise in blood pressure is due to irritation of the vaso-motor centre, previous to its paralysis, by small doses.

9. The reduction in the pulse is due to direct action of the poison on the heart, through paralysis of its motor power.

10. Sanguinarina has no action on the liver.

11. It causes marked salivation.

12. It slows the respiratory movement by prolonging the pause after expiration.

13. This reduction is caused by loss of tonus of the respiratory centre.

14. Small doses cause an irritation of the respiratory centre, and consequently an increase in the number of respiratory movements.

15. Applied locally, sanguinarina soon causes complete paralysis of striped muscular fibre.

16. It always causes dilatation of the pupil.

17. It is an emetic.

18. It always lowers the temperature.

19. When introduced into the circulation, it diminishes muscular contractility.

The above experiments were made in the Physiological Laboratory of the University of Pennsylvania, under the supervision of the Demonstrator of Experimental Physiology, Dr. Isaac Ott.

ART. IV.—*A Contribution to the Pathology and Therapeutics of Contused Wounds of the Eyeball.* By CHARLES S. BULL, M.D., Ophthalmic Surgeon to Charity Hospital; Assistant Surgeon to the New York Eye Infirmary.

THE following remarks are based upon the clinical features manifested by twenty-five cases of contused wounds of the eye; the observations recorded extending generally from the time of injury to the final discharge of the patients from treatment. The question of serious injury to the media and internal coats of the eye, with diminution or entire loss of the visual power, without any external wound, is one of great importance, and unfortunately of frequent occurrence; and a careful and long-continued observation of the course and result of such injuries may perhaps be of some help to us in our therapeutics, and enable us to form a more correct prognosis.

In considering this class of injuries, the state of the peripheral nerves is of some importance, as well as the tunics and media of the organ of vision. In mechanical injury of nerves, Weir Mitchell tells us that "a certain share of functional loss depends upon the cutting, tearing, stretching, or bruising of nerve-tubes, and to this are soon added congestion, inflammation and sclerosis; so that the remote pathological consequences are very often more serious than the primary hurt." Generally, in contusions, the neurilemma remains unbroken, but often hemorrhages occur within the sheath, and may pass for some distance beyond the seat of injury. It is a not uncommon occurrence that blows upon the eye sometimes involve the supraorbital and infraorbital nerves, and are thus the cause not only of severe attacks of neuralgia, but also of a disturbed innervation of the eyeball, which may lead to disastrous results, independent of those caused directly by the original contusion.

Another almost constant accompaniment of these injuries is intraocular hemorrhage, and its importance varies with its locality and source. A third feature is the direct influence of the contusion upon the retina. The diagnosis of contusion of the retina or commotio retinæ, is generally based upon negative signs, and can only be made by exclusion. It was

diagnosticated much more frequently in pre-ophthalmoscopic times than since. But we should look for some localized retinal lesion, and when a visible lesion does not suffice on physiological grounds to explain the disturbance of vision observed, then we may perhaps assume a contusion of the retina. Experience teaches us that a permanent failure of vision, of traumatic origin, can almost, without exception, be explained by anatomical changes. The loss of vision immediately following the injury, which only lasts for a short time, is doubtless due to a narrowing of the retinal arteries.

The changes in the vitreous humour in this class of injuries are of some interest in connection with the prognosis. They may vary from a fine, delicate opacity, due to a general shaking-up of the contents of the eye by the force of the blow, all through the various degrees of inflammatory exudation, up to profuse intraocular hemorrhage from the rupture of some large vessel. The slighter degrees of opacity generally disappear in the course of a few days without any treatment, but with the larger floating or fixed opacities, some of which assume a membraniform character, this is not often the case. They are usually the result of some active inflammatory, exudative process, except in the case of floating blood-clots, and are generally more or less permanent in character. An eye filled with these fixed membrane-like threads is practically useless, even though the other media be clear, but still something may be done towards causing their disappearance by absorption. Here internal medication does scarcely any good, but the local application of electricity will sometimes effect a great deal. The constant current from a battery of from eight to twelve cells, one pole applied upon the closed eyelids, and the other over the sympathetic in the neck, or on the nape of the neck, for ten minutes every day, will in many cases cause a disappearance of the opacities and a clearing up of the vitreous in a comparatively short space of time. Of course this treatment should be resorted to only after all inflammatory symptoms have subsided, and the eye has become perfectly quiet.

The effusion of blood into the anterior chamber is a very common result of contusions of the eyeball, and in the majority of cases the blood is entirely absorbed, provided that there are no grave pathological processes going on in the eye. The absorption often takes place spontaneously, but may sometimes be hastened by cold applications and atropia. The rapidity of absorption varies with the condition of the blood effused. If coagulation has taken place, absorption is very slow and always imperfect, leaving behind it pigment and small clots. This is particularly so in cases of chronic inflammatory disease within the eye. Of course the channels by which absorption takes place, are necessarily the same as those by which the processes of nutrition go on in a state of health, and hence need not be considered.

Very often cases of hemorrhage into the anterior chamber are met with, in which, after all the blood has been absorbed, there still remain some spots upon the anterior capsule, and this, too, without any injury to the capsule or lens. These residua are generally permanent, or at least, last for a long time, and in the end may be the indirect cause of capsular opacity.

In regard to the results of contused wounds of the eye, we cannot always make an unreserved prognosis even after a careful examination of the case, and a full appreciation of the amount of visible injury sustained. With all its delicacy of structure, the eye will sometimes bear a much greater amount of damage than would be thought possible, and yet finally prove a very serviceable organ.

An interesting feature in these cases is the amount of violence the lens will sustain without being injured or even dislocated. It might be supposed that the delicacy of structure of the suspensory ligament of the lens would yield to a very small amount of violence, and yet cases are frequently seen in which the force of the blow has been so great as to fill the eye with extravasated blood, paralyze the muscle and dislocate the pupil, and yet the lens remains *in situ*, and shows no evidence, at least, of immediate injury. It is possible that the direction of the blow exerts some influence in this respect, and that in those cases in which the lens remains in position, the force of the blow has been expended in the direction of least resistance, that is, directly from before backwards, where the eyeball is driven against the yielding orbital fatty tissue, and so escapes some of the direct violence.

In regard to treatment, the great desideratum seems at first to be rather a negative one—not to do too much. With atropia, local bloodletting and occasional resort to the influence of mercury, and enforced quiet in a moderately darkened room, we can do much to counteract the effects of such injuries. Moreover, we should not be in too much of a hurry to advise the enucleation of such an injured eye, simply because vision seems irretrievably lost, and the eye apparently destroyed. Experience teaches us all that by careful and long-continued treatment, some sight may, in many cases, be restored. If the patient can be kept under constant observation, and no signs of sympathetic trouble have as yet appeared, and the injured eye is not certainly destroyed, the best surgery is not to enucleate. But, the moment sympathetic irritation appears, there is but one course to pursue. If the patient cannot be kept under observation, then the best plan is to enucleate at once, and thus avoid the possibility of any future trouble. Rupture of the choroid is a rather uncommon result of contusion of the eye; but yet sometimes occurs when other more delicate constituents of the organ remain uninjured. It has been supposed that at the moment of the occurrence of the injury the ciliary muscle has been strongly contracted, and pulling from its

origin upon the choroid in a general antero-posterior direction, has rendered it tense, and thus, perhaps, more liable to give way to any extraneous violence. However, this is still a matter of theory, and, perhaps, not susceptible of proof. The rupture may be due in individual cases to a preternatural tenuity of the choroid, or to some diseased condition in the membrane, which had not manifested itself to the patient.

The cases that follow are given as briefly as possible, with reference to symptoms, treatment, and results.

CASE I. *Contused Wound of Eyeball; Rupture of Choroid.*—M. B., æt. 36, cartman. On May 9, 1874, received blow on R. E. from a stone, and since then has been entirely blind. Lids at first very much swollen, but when he could open them, found eye full of blood. Admitted to Infirmary May 20, 1874, and then eyeball stone hard, V = 0. It was not until one month later that blood in anterior chamber showed signs of absorption, and upper part of iris became dimly visible. Tension diminished and V = perception of light. On August 7, 1874, V = fingers at four feet with nasal half of retina. Blood nearly all-absorbed from anterior chamber, but still a little on capsule. Floating masses in vitreous. Pupil widely dilated upwards, but irregularly downwards and outwards. Membrane over lower part of pupil—fluttering iris. Tension below normal. On Sept. 4, 1874, media comparatively clear, though still some floating membranes in vitreous. Optic disk very clear, and just below and to its outside, a crescentic rupture of choroid with concavity towards disk. Tension still below normal. No sign of any sympathetic trouble. No increase of vision. One month later, tension still at same point, vitreous perfectly clear, V = fingers at ten feet, and general condition of fundus the same. From this time there was no further improvement in vision or visual field. The situation of the choroidal rupture, though not exactly in the macula, still encroached upon it so closely as to render central vision impossible. The lens remained intact, and is one remarkable feature in the case. Another point of interest is very slow absorption of extravasated blood in anterior chamber and vitreous, the period of observation covering space of five months. It is also worthy of notice that no serious inflammatory process resulted from injury, in spite of large floating clots and pupillary membrane.

CASE II. *Contused Wound of Eyeball; Cataract.*—J. M., æt. 27, farmer. Two months before admission, patient received blow on L. E. from barrel-hoop, which caused iritis, posterior synechiæ and cataract. No marks at present of any external wound, and eye is now perfectly quiet and there is no pain. At first pain was excruciating, and he was leeched at temples, and blistered behind the ears and on the nape. Pupil is now distorted and immovable. V = qualitative perception of light. No sympathetic trouble. As field of vision was good, decided to attempt removal of cataract. Peripheral linear incision upwards, a broad piece of iris removed, but in shreds, as it was found very rotten. Lens shrunken and firmly adherent to iris, and extracted with considerable difficulty, but no vitreous lost. Violent inflammation followed, with closure of pupil and increased tension, which lasted three weeks. One month later iridotomy through false membrane with good result, V = $\frac{20}{200}$. No view of fundus obtainable, but vitreous probably filled with mem-

braniform exudations, the result of the inflammation following first operation.

CASE III. *Contused Wound of Eyeball.*—J. T., æt. 19, labourer. Eight years ago was struck on R. E. with a stone, which produced extensive iridodialysis, peripheral detachment of iris being on nasal side. Has never been able to see much since, but eye has never given any trouble till four weeks ago. It then became irritable and painful. On admission, marked ciliary injection, pupil widely dilated and immovable, tension very much increased, and some vague signs of sympathetic trouble.

By ophthalmoscope, R. E. vitreous hazy, nerve indistinct, enlarged retinal vessels—irido-choroiditis. V = movements of hand.

L. E. Retinal hyperæmia, V = $\frac{20}{30}$.

Here was a case of severe injury in which eye had remained perfectly quiet for eight years, and had then become inflamed without any apparent cause. Leeches to temple, atropia, and gr. $\frac{1}{15}$ of hydrarg. perchlorid. three times a day, and the fellow-eye carefully watched. The lens of injured eye began to show a general peripheral cloudiness, tension remained above normal, and pain soon became very severe, while vision in fellow-eye sank to $\frac{20}{40}$, and enucleation was therefore performed. The wound healed rapidly, and all sympathetic trouble disappeared on the third day after, and patient discharged at end of week.

The eyeball, after hardening, was opened in vertical meridian. No great change in contents visible to naked eye, except some small membranes in vitreous. But their sections showed diffuse choroiditis and cyclitis, with dilatation of bloodvessels, exuded blood corpuscles and proliferating cells in abundance, and the same thing was found in vitreous.

CASE IV. *Contused Wound of Eyeball.*—J. M., æt. 18. Seven months before received kick on R. E. Lids swelled and became ecchymosed, and remained closed for two weeks. When he could open his eye, found V. very much impaired. Has always been myopic. On admission, a circumscribed ciliary injection in both eyes over insertion of external rectus. In R. E. iris discoloured and pupil small and very sluggish. R. E. V = $\frac{1}{100}$, L. E. $\frac{10}{100}$, and with concave 8, V = $\frac{20}{100}$.

In R. E., detachment of retina below disk and encroaching on it in two loose sort of sacks, marked neuro-retinitis. Three days later, the two bags had coalesced, the vitreous was hazy, and inflammatory process progressing. Patient, from own admission, has never had binocular vision for near objects, but R. E. has turned outwards constantly for last two years, and vision always worse than in L. E. A curious feature is localized vascular injection in both eyes over external rectus muscle, which may be connected with the injury, or with the overbalancing tension and action of external recti muscles. Thinks vision in L. E. no worse than before the injury.

Confinement in bed in dark room, three leeches to temple every second night, and atropia every three hours. Under this treatment the general œdema of retina grew less, as did also haziness of vitreous, but detached retina remained the same. The improvement was only temporary, for œdema of retina returned, the vitreous again became hazy and finally opaque from inflammatory exudation, and tension fell decidedly below normal. Vision reduced to faint perception of light. In three weeks from time of admission even this amount of vision had vanished, and process of shrinking was well advanced. During whole period of inflamma-

tion the cornea remained transparent. Vision in L. E. was never affected.

In this case the interesting feature was the time, seven months, that elapsed between the receipt of the injury and the final severe inflammation, and yet, all this time the degenerative process had been going on, with a surprisingly small amount of evil result.

CASE V. *Contused Wound of Eyeball.*—J. H., æt. 35, cartman. Blow on L. E. with wooden mallet the day before admission. Lids swollen and ecchymosed, profuse subconjunctival hemorrhage. Iris discoloured, pupil dilated and immovable, small hemorrhage into anterior chamber. Vitreous full of blood. Tension diminished, V = perception of light.

Two days later, blood in anterior chamber absorbed. Pupil drawn downwards and inwards, and irregularly dilated. Blood in vitreous almost entirely absorbed, and all detail of fundus clearly seen. V = $\frac{20}{70}$+.

Two days later, V = $\frac{20}{50}$+. Pupil widely and equally dilated, and vitreous clear, except a delicate opalescence. No visible injury to retina or choroid, and no sign of any ruptured vessel. Vision did not improve from this point for nearly three weeks, though the media remained perfectly clear, and tension was normal. Here a diagnosis of concussion of the retina is probably correct. After the use of atropia, dark room, and a delicate current of electricity from a battery of three cells for three weeks, vision began to improve, and after two weeks more of same treatment, V rose to $\frac{20}{50}$–, and patient was discharged.

CASE VI. *Contused Wound of Eyeball.*—J. G., æt. 22, printer. Was struck on R. E. by stick three days before admission, and lost the sight immediately. There was a profuse hemorrhage, and the eyelids became greatly swollen. On admission, eyelids ecchymosed, conjunctiva filled with blood, movements of eyeball limited in every direction, cornea clear, anterior chamber very deep and half filled with blood. Iris retracted upwards, inwards and outwards, pupil almost quadrangular and displaced downwards. On closer examination, almost total irido-dialysis. Lens dislocated backwards, vitreous opaque. Great pain in eye, extending to forehead and temple, and photophobia and lachrymation in fellow-eye. Enucleation advised, but declined till tenth day after accident, when symptoms of sympathetic trouble were much more marked, and the patient consented to the operation.

Here the marked limitation of excursive movements of eyeball probably due to a profuse hemorrhage into orbit. It seems strange that so great violence did not rupture the eyeball. L. E. V = $\frac{20}{30}$. Patient discharged on seventh day.

Examination of eyeball after hardening: Anterior chamber very deep, iris torn from peripheral attachment, except for small space directly upwards. Anterior chamber filled with pus, blood and inflammatory exudation; lens dislocated upwards and backwards. Ciliary body torn from attachment, except upwards. Retina totally detached. Choroid detached from sclera upwards and backwards, and space filled with inflammatory detritus. Space between retina and choroid filled with same.

CASE VII. *Contused Wound of Eyeball; Rupture of Choroid.*—R. C., æt. 43, iron-moulder. On day of admission, was struck on L. E. by a large mass of clay with great force. Was knocked down by blow, eyelids filled with extravasated blood, and could not open them for three days. Not much pain after accident. Cold applications and atropia.

On the fourth day eyeball visible for first time, cornea clear, some blood at bottom of anterior chamber, iris discoloured and fluttering, pupil widely but irregularly dilated. Lens in position, but zonula ruptured. No cataract, but vitreous perfectly opaque from hemorrhage. Tension increased. V = 0. No pain. Cold applications and atropia continued, but no improvement till tenth day, when blood in vitreous began to be absorbed. V = perception of light. Slow, but steady improvement up to twenty-eighth day, when most of blood absorbed, with exception of floating clots of small size, tension below normal. V = fingers at three feet eccentrically. To the outside of optic-nerve, and just below the macula, was a long, white, crescentic patch, with concavity downwards, its margins bordered with blood-clots. This was a rupture of choroid, about six lines long apparently, in upright image, not involving the macula, but encroaching near it below.

From this time vision slightly improved so that he could count fingers at six feet after another month had elapsed, but always with nasal half of retina, and it never improved above this. Tension always remained diminished.

Here was a case where the blow was so violent as to knock the patient down, and rupture the choroid, yet the lens was not dislocated, nor was cataract the result.

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ART. V.—*Acute Bronchocele with Cardiac Hypertrophy occurring during Pregnancy, and producing Fatal Dyspnœa.* By JOHN B. ROBERTS, M.D., Resident Surgeon, Pennsylvania Hospital.

WE are accustomed to look upon bronchocele as an affection of importance chiefly on account of the deformity of the neck, and hardly realize that in certain cases it may cause death with great rapidity by asphyxia, the result of direct pressure on the trachea, or of interference with the nervous element of respiration, by the mechanical involvement of the important nerves traversing the neck. A case in point was recently admitted into Dr. R. J. Levis's ward in the Pennsylvania Hospital.

Mary C., aged 27 years, Irish, and in about the sixth month of utero-gestation, was admitted on December 30th, 1875, on account of violent and threatening paroxysms of dyspnœa. Four months previously, when she was about two months pregnant, there had been noticed a slight prominence of her eyeballs, which was followed by a small swelling of the anterior part of her neck, to the right of the median line. About the same time her attention was attracted to palpitation of the heart when taking active exercise. As she progressed in her pregnancy the cervical tumour continued to increase in bulk, and about two weeks before admission, at the time of quickening, she was attacked with frequent paroxysms of dypsnœa that almost reached the point of asphyxia.

The examination on admission showed slight prominence of the eyes, and an enlargement of the thyroid gland, which was especially marked

on the right side, where the tumour was about the size of a large egg. The first sound of the heart seemed rather heavy, but there was no murmur. The patient's respiration was laboured, and three or four times daily the dyspnœa became so aggravated that the woman was almost asphyxiated. During these paroxysms, which lasted three or four hours, she presented a picture of the utmost distress; she screamed outright, threw her arms about, and struggled for breath, while the turgid veins of the neck, the streams of perspiration running down her cheeks, and the lividity of her countenance added to the horror of the spectacle. The paroxysms not unfrequently terminated by vomiting, and during them she sometimes became delirious.

Laryngoscopic examination, made by Dr. J. Solis Cohen, showed tumefaction of the arytenoid cartilages, and revealed that the glottis was not œdematous, but that, although vibrating spasmodically, it did not close as much as normal. There was, however, particularly on the *left* side, bulging inward of the tracheal wall.

It was decided to undertake some operation, and accordingly laryngotomy was performed, as tracheotomy was not possible on account of the enlarged thyroid extending upwards over the trachea. Although this was done, and although the operator could force his finger into the windpipe, thus dispelling the idea of stenosis of the tracheal tube, yet the patient's respiration was still much embarrassed. She did not have a recurrence of the violent paroxysms, but continued to breathe with difficulty, and finally died, January 1st, 1876, twenty-nine hours after the operation, or about fifty-five hours after admission into the hospital.

The *autopsy* was made about 16 hours after death. The lungs were not adherent, and presented evidences of slight congestion. The pericardium contained a large amount of effusion; the heart was greatly hypertrophied, weighing, without the contained clots, 20½ ounces, but there was no valvular insufficiency. The liver was normal. In the situation of the spleen there was found a small, hard, granular body, rather triangular in shape, and with what appeared to be a hilum. Its weight was 54½ grains. The supra-renal capsules were normal in size, but were somewhat hardened, and had indurated masses on the surface. The kidneys were of the natural size, and the capsule peeled off normally, but they were lobulated on the surface, and were somewhat congested.

The tumour of the neck was found to be the thyroid gland, which was hypertrophied and surrounded the trachea from its junction with the œsophagus on one side to a similar point on the other. The tumour at the sides reached as high as the top of the larynx, and with the inclosed trachea measured 8½ inches in circumference; the enlargement on the left side was about the same as on the right, though before death the tumour was more prominent on the right side. The isthmus was hypertrophied and bulged forwards between the ribbon muscles of the neck. The tracheal wall was slightly pushed inward by the tumour on the left side. The incision made in the operation was about one inch long, and was found to extend obliquely through the left side of the thyroid down to the cricoid cartilage. Its upper part divided the two left vocal chords, and it extended beneath the enlarged thyroid isthmus. The tumour was a simple hypertrophy of the thyroid gland, and contained no cysts. The recurrent laryngeal nerves ran beneath the gland along the sides of the trachea, and the tumour had to be dissected up to expose them. The left nerve was smaller than the right. The bronchial glands also were en-

larged. The fundus of the gravid uterus was about 2½ inches above the umbilicus. The fœtus was not removed.

This case is interesting because it is unusual for bronchocele to produce fatal dyspnœa, and this occurrence in connection with *acute* bronchocele is still more uncommon; while the combination of pregnancy and acute bronchocele followed by asphyxia is one of the rarest conditions found in medical or surgical practice.

Bronchoceles attain great bulk, even, as in a case mentioned by Alibert, reaching to the thighs, but they seldom cause pressure on the structures of the neck sufficient to endanger life. This complication is perhaps more frequent than supposed, for within a year there have been in the Pennsylvania Hospital two cases somewhat similar to the present, where suffocation resulted from the presence of bronchocele. The first case was under the care of Dr. T. G. Morton, and the second under that of Dr. J. J. Kirkbride.

The former of these, Joseph S., aged 40, was a native of England, married, and by trade a cotton carder; had had a tumour in the anterior part of his neck for 18 months, which, however, had grown with great rapidity during the last three months, and had caused for four weeks previous to admission dyspnœa of a severe character. He said that his brother had some kind of a tumour in his neck, but the patient could not describe its character. On Nov. 18, 1874, when the man was admitted, the neck from the centre of one sterno-mastoid muscle to that of the other measured 6½ inches; the vertical measurement of the tumour was 4 inches. The tumour was freely movable and showed the presence of a cyst by fluctuation. Under treatment there was improvement, and on December 7th, 1874, the tumour measured 6 inches transversely, and 3¾ inches vertically; and there was no longer any interference with respiration. The size of the tumour, however, was not constant, but, without any relation to the treatment, increased and decreased irregularly. On Feb. 18th, 1875, the tumour had increased very much, and greatly interfered with respiration and deglutition; so much so that he could not lie down, and was scarcely able to take nourishment. He died in the afternoon of this day exhausted. The post-mortem examination of the tumour showed on the left side an enlargement of the thyroid gland, extending from the œsophagus to the middle line of the trachea, and from the level of the middle of the thyroid cartilage to within half an inch of the origin of the great vessels from the aorta. The upper portion of this tumour was a cyst the transverse circumference of which measured 7½ inches; the internal surface of this cyst was lined with hard nodules. Below the cyst, and lying in the space between the left carotid and the innonimate and right carotid, and to the left of the trachea, which was pushed to the right by the tumour, was a fibrous mass 1½ inches in diameter. The thyroid isthmus was not much hypertrophied; the right lobe was 1¼ inches in transverse diameter. The trachea was pushed to right, and about one inch below the larynx its calibre was reduced about one-half by the lateral pressure.

The second case was not a cystic bronchocele, and was much more acute in its progress.

William C., aged eighteen years, a painter, unmarried, born in Ireland,

was admitted on July 5, 1875. He stated that he had observed, about the middle of June, that he buttoned his collars with difficulty. The following day his throat had increased in size so much that he could not button his shirt (?) The swelling rapidly increased until he had difficulty in breathing, when he sought treatment in the hospital. At the time of admission, the tumour, which was evidently thyroidal, was the size of a cocoanut, and his respiration was a good deal embarrassed, though he could eat his dinner, and afterwards walked in the yard. There was no cardiac murmur detected. In the afternoon a violent paroxysm of dyspnœa occurred, which soon abated; but he grew worse, and his laboured respiration could be heard for a long distance through the house. The attacks of dyspnœa became more and more frequent, and tracheotomy was suggested, but deemed useless. The patient died cyanosed the morning after admission. The specimen shows enlargement of both lobes and of the isthmus which completely surround the trachea. The tumour is very soft and lobulated; on the sides it extends upwards to the base of the arytenoid cartilages, while the isthmus reaches to within a quarter of an inch of the notch in the thyroid cartilage. Between the isthmus and the highest point at each side there is a notch in the tumour which leaves exposed the surface of the thyroid cartilage. Both lobes are about equally enlarged. The circumference from the œsophagus on one side around to the other, including the trachea in the mass, is now (seven months after death), $6\frac{3}{4}$ inches. It is said that, when removed, the tumour weighed four pounds. The specimen has been kept in chloral. The trachea was not laid open.

The first of these cases is an example of the rapid development which may occur in old bronchoceles; while the latter shows with what extraordinary rapidity the thyroid gland may increase and cause death in a few weeks by asphyxia. The second patient noticed that his collar was too tight—a point, by the way, likely to be noticed at the very incipiency of the disease—in the middle of June, and died on the 6th of July.

In looking over the literature of the subject, I have found, exclusive of these Pennsylvania Hospital cases, but five cases mentioned where death has occurred, or would have occurred except for operative interference, on account of obstruction to respiration, within a year after the beginning of the disease; and only one case where starvation resulted as a sequence of pressure upon the œsophagus.[1] Although this is a small percentage when we reflect on the prevalence of goitre in certain districts, yet it "points to the propriety of regarding any acute enlargement of this gland in young people with more anxiety than we are accustomed to do."[2] As to the fact of bronchocele being acute, there are among the cases collected, including Levis's, six which did not date beyond five months; and I have found several recorded where there was a rapid development of old tumours leading to asphyxia. Below is a schedule of the acute cases not over one year in developing.

[1] Watson, Practice of Physic, p. 424.
[2] Risdon Bennett, Intra-thoracic Growths, p. 169.

	Sex.	Age.	Date of growth.	Size of tumour.	Condition of heart.	Operation.	Result.	Autopsy.	Remarks.
Davies[1]	M.	16	1 yr.	.....	.....	None	Death	Thyroid, thymus, and bronchial glands enlarged	Rapid increase for four months.
Risdon Bennett[2]	M.	19	3 mos.	When removed as large as two fists	Normal	Tracheotomy	Death	Trachea compressed and twisted to the left	Female catheter used, but could not pass the obstruction. Simple hypertrophy. No exophthalmos.
Trousseau[3]	M.	14½	3 mos.	.....	.....	Phlebotomy; ice locally; digitalis	Cured	.....	Tracheotomy was determined upon if he was not relieved by these less severe measures.
Caird[4]	M.	16	3 wks	.....	Normal	Tracheotomy	Cured	.....	India rubber catheter introduced. Tumour disappeared in one week, there having occurred meanwhile secondary hemorrhage.
Kirkbride[5]	M.	18	About 3 wks	6½ inches in circumference	Normal	None	Death	Trachea compressed	Tumour weighed 4 lbs.(?)
A. Weil[6]	F.	46	5 mos	Man's fist	Normal	None	Death	Right recurrent nerve flattened and atrophied. Left unaltered. Vagus & sympathetic normal Trachea compressed & perforated.	Had aphonia. Paralysis of right vocal chord seen by the laryngoscope.
Levis[7]	F.	27	4 mos.	8½ inches including the trachea	Hypertrophy	Laryngotomy	Death	Trachea slightly compressed. Recurrent laryngeal nerves were involved in the tumor.	About six months pregnant. Dyspnœa began about time of quickening.

There are reported[8] two fatal cases where the disease was connected with pregnancy, in both of which, as in the present, the bronchocele was developed during the first gestation and was followed finally by asphyxia. M. Guillot, in speaking of his own cases, says that Paul Dubois[9] saw a similar case, but he gives no particulars. Guillot's cases differ from Levis's case in that the fatal termination did not occur so soon. The following is a succinct account of the course of the disease in both his cases.

In the first case the patient when thirty years of age became pregnant, and during gestation, which was her first, observed an enlargement of the thyroid gland. This enlargement increased during her second pregnancy, but seems to have caused no interference with respiration until twenty-four and a half years later, when the tumour measured nearly three inches in diameter. The patient,

[1] Holmes, System of Surgery, v. 295.
[2] Risdon Bennett, Intra-thoracic Tumours, p. 167.
[3] Clinique Médicale de l'Hôtel-Dieu, ii. 543.
[4] Lancet, January 29, 1876.
[5] This article.
[6] Deutsches Archiv für Klinische Medecin. xiv. p. 90.
[7] This article.
[8] Archives Générales de Médecine, vol. xvi. p. 513.
[9] This case is also mentioned by Grisolle, Pathologie Interne, ii. 213.

by that time an old woman, had paroxysms of dyspnœa, palpitation, vomiting and facial neuralgia. Laryngotomy gave immediate relief, but she died two days subsequently.

In the second case the fatal issue was not delayed so long. The woman, who was born in Paris, when twenty-five years old noticed after her first pregnancy that there was some increase in the size of her neck. There was no further increase, however, and two years subsequently she became pregnant again. After this the tumour increased in bulk until she came under M. Guillot's observation nineteen months later. At this time, nearly four years after the first indication of bronchocele, the tumour had a circumference of nearly twelve inches, and extended from the thyroid cartilage to the sternum. The patient suffered from frontal neuralgia, paroxysmal dyspnœa, palpitation and thoracic pain. She died asphyxiated without any operation having been performed. At the autopsy the thyroid body was as large as a man's brain, and compressed the pneumogastric nerves and the carotid arteries against the spinal column. The trachea was flattened throughout its entire length until the antero-posterior diameter was only about one-tenth of an inch while the lateral was nearly four-fifths of an inch. The condition seemed to be simple hypertrophy of the thyroid gland depending upon an increase of fibrous tissue.

These two cases differ from the one under consideration because the bronchocele was much slower in development. In Levis's case the growth had been noticed only four months before death, while in the first case it had existed twenty-four or twenty-six years, and in the second case about four years. Moreover, in the last two cases the patients passed safely through gestation and parturition, but in the first death took place about six months after impregnation. In Guillot's report it is not stated at what months of gestation the first symptoms of bronchocele were perceived; but in this instance the exophthalmos and indeed the tumour itself were noticed about the second month, and the dyspnœa became marked at the time of quickening.

In reviewing these three cases we must ask: Had the pregnancy of the patient any part in causing or accelerating the growth of the bronchocele, or was it merely an accidental complication? That there is some obscure sympathetic link between the uterus and the thyroid gland was recognized by early writers. Andreas Pasta thought that women were more subject to certain forms of bronchocele than men, because a debility is induced in the gland in consequence of the vomiting of pregnancy.[1] Lalouette imagined that during the throes of labour air was forced from the trachea into the cellular tissue of the gland, causing an aerial tumour.[2] These crude opinions show that the subject was a matter of discussion years ago. In Cooper's *Surgical Dictionary*, under Bronchocele, it is stated that "Women are far more subject to the disease than men, and the tumour is observed to be particularly apt to increase rapidly during confinement in childbed."[3] Holmes Coote mentions a case where hypertrophy of the thyroid occurred and became permanent after an abrupt cessation of the menses.[4] Another writer says, "I see almost every year, in the wards of

[1] Barton on Goitre, p. 47. [2] Barton, p. 47. [3] Vol. ii. 733.
[4] Holmes, System of Surgery, v. 289.

the Necker Hospital, women in whom the thyroid body is enlarged during the period of pregnancy."[1] These statements show that the association of pregnancy and thyroid enlargement occurs too frequently to be a mere coincidence.[2] Dr. Frank Woodbury, of Philadelphia, has lately had a case under his care where the goitre was noticed soon after a second pregnancy. It has increased gradually, but the patient "made the voluntary statement that the swelling looks much larger during pregnancy than at other times, and grows much faster while she is in this condition."

By some authors the thyroid gland is supposed to be a reservoir to prevent sudden congestion of the brain; and some have also advanced the theory that the enlarged gland during pregnancy presses on the carotids and thus prevents cerebral congestion which is rendered possible by the impeding of venous return.[3]

The first theory seems much more tenable than the last, for there are undoubtedly sudden and transitory enlargements of the thyroid gland occurring during violent exertion which can only be accounted for on the supposition of temporary engorgement.[4] As to the other theory, it is probable that any tumour exerting pressure on the carotids would also compress the jugular veins, and thereby tend to increase cerebral congestion.

M. Guillot thinks the fibrous bronchocele, found in his case where an autopsy was made, was produced in a manner analogous to the enlargement of the uterine wall and the mammary gland that takes place during gestation owing to an increase of fibrous tissue; and that it was "one of the consequences and one of the evidences of the activity of fibrous elements impressed on the system" at that time.[5] This view of the matter, although hardly explaining it, still seems to be a very reasonable hypothesis to advance as a partial solution of the intimate connection certainly existing between the condition of pregnancy and bronchocele.

M. Poincare, having observed the great richness of the thyroid gland in nervous filaments, thinks that this great nerve supply accounts in some measure for the close relationship between the organs of generation and the thyroid gland.[6]

What was the cause of the dyspnœa in this case of acute bronchocele? Was it caused by narrowing of the trachea? Was it cardiac dyspnœa resulting from the pathological condition of the heart in a case of Graves' disease? Was it produced by the tumour compressing the nerves supplying the respiratory muscles? or was it a reflex phenomenon dependent upon uterine irritation?

Tracheo-stenosis might undoubtedly be the cause of the difficult respira-

[1] Archives Générales de Médecine, Nov. 1860, p. 514.
[2] Holmes, System of Surgery, v. 295.
[3] N. Y. Medical Journal, 1875, pp. 450, 451. [4] Id. 453.
[5] Archives Générales de Médecine, Nov. 1860.
[6] Lancet, April 22d, 1876, quoted from Robin's Journal de l'Anatomie, 1875.

tion, but this is more apt to be the case when the isthmus of the thyroid gland especially is hypertrophied, or when the bronchocele is post-sternal and consequently cannot project forwards as it increases. In this case, however, Dr. Levis after the laryngotomy inserted his finger into the trachea and could find no narrowing of the tube; and the autopsy showed that there was only very slight pushing in of the wall on the left side. Hence the urgent dyspnœa could not depend wholly on tracheo-stenosis, though we must admit that the asthmatic paroxysms did not recur after laryngotomy was performed; but neither did the patient react from her condition of partial asphyxia as she ought certainly to have done after the insertion of the tube, had the dyspnœa been caused by tracheo-stenosis above the point of operation, or by laryngeal trouble. The fact that the dyspnœa was paroxysmal would, I think, dissipate the idea that it was caused by tumefaction of the mucous membrane from intercurrent tracheitis or laryngitis.

The coexistence of palpitation, cardiac hypertrophy, and exophthalmos with the goitre, certainly places the case under the head of Graves' disease (exophthalmic goitre), but as the exophthalmos was slight, and the palpitation a symptom only mentioned by the patient after questioning, it seems to me improbable that the violent suffocative attacks were cardiac in their causation. And, moreover, paroxysms of urgent dyspnœa are not mentioned by the authorities as being apt to accompany uncomplicated hypertrophy of the heart or to attend exophthalmic goitre except after the bronchocele has become large. It therefore seems that the dyspnœa must be attributed to pressure upon the nerves of the neck or to reflex uterine irritation.

As stated in the post-mortem record the recurrent laryngeal nerves on both sides were found lying between the trachea and the tumour, and were undoubtedly pressed upon by the enlarged gland; this was doubtless the cause of the harsh tone of the patient's voice.[1] The sympathetic, pneumogastric, and phrenic nerves were subjected of course to the general pressure caused by the tenseness of the cervical tissues, which could not but be great, as the tumour was so rapid in its growth, and was restricted by the dense overlying fascia.

A writer,[2] speaking of goitre asthma, says:—

"On this point Stoerck's ideas are interesting. He says it does not come from pressure on the trachea, but on the pneumogastric or recurrent nerves, giving *sub*-paresis of the lateral crico-arytenoid muscles. Phonation is sometimes laboured, and sometimes there is noisy inspiration. There is nothing to see with the laryngoscope. The dyspnœa is paradoxical, for the glottis is abnormally *open*."

This corresponds exactly with Dr. Levis's case, for the examination with the laryngeal mirror showed the rima glottidis abnormally patent, and the

[1] See Case 6 in preceding table. [2] N. Y. Medical Journal, 1875, p. 457.

dissection post-mortem proved that there was pressure on both recurrent laryngeal nerves. The same writer goes on to say:—

"It (goitre asthma) may come from nervous influence, or from mucus getting past the glottis, but more probably from the glottis not closing, and thus allowing the bronchial muscles to force the air on into the lungs beyond, since it is relieved by stimulating the muscles to close the glottis."

In the present case it was thought that the diaphragm did not act freely, which would add to the theory of pressure on the phrenic nerve; but in a pregnant woman it would be difficult to determine that there was diaphragmatic paralysis; and, moreover, the phrenic nerve lies nearly three-quarters of an inch from the edge of the normal thyroid gland, and it would require great hypertrophy of the latter to bring direct pressure upon it.

Regarding the cause of the dyspnœa, another opinion might be entertained, viz., that it was not connected with the bronchocele at all, but was dependent on uterine irritation, for during gestation the respiration is at times embarrassed, and severe dyspnœa occurs.[1] Still another instance of reflex symptoms of this character is seen in the asthma occurring in connection with uterine tumours.[2] This view, however, is hardly tenable in the face of the number of cases of goitre given where fatal dyspnœa occurred in women who were not pregnant, and in men.

It must be acknowledged, then, that although the uterine condition was an important agent in regard to the development of the tumour, and perhaps aided in the production of the respiratory distress, yet the great factor in all probability was nerve compression, resulting from the rapid growth of the goitre under the cervical fascia.

The most important question in regard to the whole subject, however, is yet to be discussed, and that is: The line of treatment to be pursued in cases of acute bronchocele producing great dyspnœa.

It has been mentioned that tracheo-stenosis is most apt to be produced when the thyroid tumour is situated behind the sternum, and cannot bulge forwards. The same effect is produced in a less degree by the tense cervical fascia, for if the tumour develops with great rapidity the cervical fascia does not distend before it, and as a consequence pressure must be exerted on the parts which are in the vicinity, and either tracheo-stenosis or nerve pressure is induced. Hence in certain cases the dyspnœa is relieved by making a free incision through the cervical fascia, and permitting the tumour to protrude; and if the urgent symptoms are caused by sudden congestive increase of the glandular tumour, the patient may thus be rescued from impending death. This operation was successfully adopted by Dr. Levis in a case under his care in the Philadelphia Hospital many years ago, in which the almost asphyxiated patient was

[1] Tyler Smith, Manual of Obstetrics, p. 121.
[2] The Practitioner, December, 1875.

relieved by an incision extending from the larynx to the sternum. There are a number of other cases recorded[1] where recovery followed this operation. Mr. Cusack split the fascia of the neck, but it was done so late that respiration had already ceased; he immediately opened the larynx and introduced a flexible catheter, through which he blew, re-established respiration, and saved his patient. He thought afterwards that, if the fascia had been split sooner, there might not have been any need for laryngotomy.[2]

If the dyspnœa be dependent upon partial occlusion of the trachea, tracheotomy may be of service, especially if a long tube or a flexible catheter be introduced in order to pass below the point of constriction.[3] The hypertrophied and vascular thyroid gland generally requires the incision to be made high up in the trachea or in the larynx, and therefore a long tube is required. If nerve pressure be the cause of the symptoms, tracheotomy or laryngotomy can be of no service, as was exemplified in Dr. Levis's case, where there was, to be sure, a slight amelioration of the dyspnœa, due probably to the incision made through the fascia in reaching the trachea, but no marked relief. Tracheotomy was indicated by the bulging inward of the trachea, as seen by the laryngeal mirror, and the extreme urgency of the symptoms, but was, of course useless.

Ligation of the thyroid arteries has been done in suffocative bronchocele, but its value varies with the portion of the gland involved, and it is only available in certain cases.[4] It would not be available in sudden emergencies.

The most radical procedure is certainly the complete removal of the enlarged gland, but this is attended with great danger on account of the important vascular and nervous structures of the neck which are in proximity to the thyroid gland. Nevertheless there have been a number of successful cases reported, especially since Greene's brilliant results.[5]

Another procedure recommended is the excision of the isthmus, thus preventing the constriction of the trachea which occurs as a result of the encircling of that tube by the enlarging gland.[6]

If the dyspnœa in the case before us was caused, as it seems to have been, by pressure on the recurrent laryngeal nerves, none of these operations would have been of much avail, for the nerve was compressed by the posterior portion of the lateral lobes of the gland. It is possible,

[1] Med. Times and Gazette, May 27, 1871. Idem., Aug. 3, 1872.

[2] Lancet, Jan. 1862. [3] Lancet, Aug. 3, 1861 (2 cases).

[4] N. Y. Medical Journal, 1875, p. 465.

[5] N. Y. Med. Record, 1866-67, p. 443. Amer. Journal Med. Sci., 1871, p. 80. Idem., 1873, p. 280. London Medical Record, April 9, 1873. Phila. Med. Times, April 15, 1871, etc. etc.

[6] Lancet, Jan. 23, 1875. N. Y. Med. Record, Jan. 1, 1876. Braithwaite's Retrospect, lxxi. p. 175.

perhaps, that removing the anterior portion of the tumour might have relieved the general tension sufficiently to have allowed respiration, and thus have preserved the patient's life.

Any other strictly surgical treatment then would have been, as was tracheotomy, of little avail in this case unless it had been instituted at the very beginning of the disease, or unless the whole tumour had been dissected out regardless of hemorrhage and the dangers of wounding important nerves. At the stage in which the patient was admitted, it is evident, from post-mortem examination, that no remedial surgical procedure would have been feasible.

Would any form of medical treatment have been of use? Dr. Levis ordered that the patient should be bled very freely if she became so cyanosed as to point to immediate asphyxia; and, in order to make a very rapid flow of blood, the temporal arteries were to be cut rather than the veins of the arm. This was ordered in order to lessen the internal congestion, relieve the engorged lungs, and so secondarily to diminish the dyspnœa. Arteriotomy was not done, however, and when the consultation was called it was decided to open the trachea. Phlebotomy in a good many cases of bronchocelic asthma has been followed by relief of the symptoms; and a case of Graves' disease is related by Trousseau where a perfect cure followed venesection.[1] In addition, however, ice was applied to the neck, and digitalis administered internally. Before this triple treatment was begun, tracheotomy was indicated by the extreme oppression and the imminent asphyxia, and it had been decided in consultation to open the trachea if a rapid subsidence of symptoms did not occur. In three days from the time the treatment was instituted, the boy could go up and down stairs without oppression, and finally the cardiac palpitation entirely, and the exophthalmos and the goitre almost entirely, disappeared. It would seem in Trousseau's case that the venesection relieved the distended thyroid gland, and that the subsequent continuous employment of tincture of digitalis quieted the heart's action and prevented a second congestive enlargement of the gland. It is doubtful, however, whether the same result would have occurred in the case under discussion, in which the hypertrophy was fibrous in character.

The last question to be considered is whether the production of abortion would have been of service in averting the fatal termination of this case. At the time the patient was admitted the tumour had acquired the bulk which was sufficient to cause fatal dyspnœa; and therefore it would have been useless to have emptied the uterus. That operation would have been attended with an increase of nervous excitement, and the accompanying tenesmic efforts would have added to the difficult respiration.

In the second case mentioned by Guillot the bronchocele ceased en-

[1] Clinique Médicale de l'Hôtel-Dieu, ii. 544. See Case 3 in table.

larging after parturition, and did not again become active for a year and a half, when the patient became pregnant a second time. This would point to the propriety of producing abortion in the early stage of gestation as soon as the bronchocelic swelling became marked; but in both of his cases the enlargement continued to increase, even after the delivery of the second child. In regard to this procedure then it may be said, that, owing to the unmistakable causation of gestation in producing bronchocele, it would be the safest plan to induce premature labour in all cases where there is presented a marked swelling of the neck: although the goitre may not be dangerous in the first pregnancy, yet there is established a source of danger which is liable to become imminent in succeeding pregnancies.

From the few cases recorded it is impossible to deduce accurate conclusions, but it is readily seen that strict surveillance of all such cases is of paramount importance.

From the similar functions of the thyroid gland and spleen as blood glands, so called, there may be some supplementary relation in regard to the size of these organs; and it may be asked whether the small body found in the position of the spleen was really a spleen of miniature proportions; and if so, whether it was so small because the thyroid body had so much increased in size. This question, however, cannot now be discussed.

ART. VI.—*Femoral Aneurism treated by Plugging the Sac; Death, caused by Hemorrhage from Deep Epigastric Artery, on the Eighteenth Day; Autopsy; Remarks.* By B. A. WATSON, M.D., Surgeon to Jersey City Charity, and St. Francis Hospitals, Jersey City, N. J.[1] (With two wood-cuts.)

HERMAN R., native U. S., æt. 32, married; peddler; a well-nourished, medium-sized man, presented himself at the Dispensary connected with the Jersey City Charity Hospital in February, 1876, for examination, complaining of sharp and lancinating pains in the gluteal and sacral regions, and occasionally in the right knee. These pains were severer in stormy than in fair weather. Mentioned incidentally "a swelling in the right groin."

Examination revealed a pulsating tumour, about the size of a man's fist, situated over the course of the right femoral artery—upper margin about one inch below Poupart's ligament. The tumour could be reduced by manipulation while the artery was compressed as it passed over the brim of the pubes. Pulsations were eccentric, and almost synchronous with heart impulse. Auscultation revealed aneurismal *bruit*.

[1] I desire to acknowledge my obligations to Drs. Lathrop and Cropper for the notes used in the preparation of this report.

Patient stated that about fourteen years previously he had been kicked by a man in that spot, and soon afterwards a hard lump appeared, which was sensitive to touch, but this swelling gradually disappeared. Two years after this he noticed a "beating swelling," the size of an English walnut, which remained stationary until two years ago, when it began to increase in size. He was advised to enter the hospital, but refusing, nothing more was seen of him until the 9th of May, when he applied for admittance.

At this examination the aneurism was found to have increased greatly —being fully as large as a cocoa-nut and extending up into the right inguinal region about three inches. The walls appeared thick and boggy to the touch; pulsations evident, but not so forcible, and *bruit* less distinct. Pulsation of right popliteal artery weaker and less prompt than that of left; right leg somewhat œdematous—especially at ankle.

Stated that in the interval he had struck the tumour several times in mounting his wagon, and it had caused him considerable pain. Had been treated in a New York hospital "by means of bandages compressing the whole leg." He left the hospital on the following day without waiting for operative relief which had been suggested.

Readmitted May 26. During the interval, the tumour had increased enormously, and extended from two inches below Poupart's ligament to within one inch and a half of umbilicus, with the following measurements —long diameter, situated parallel to external iliac, nine inches; transverse, six inches; external circumference, twenty-one inches, with an elevation of two and one-half inches. Apex exhibits a dark-black spot about as large as a five-cent piece, denoting a gangrenous condition, surrounded by an areola of inflamed integument two inches in breadth, interspersed with smaller spots in a semi-gangrenous condition. Patient stated that this had appeared two days previously, and he had applied onion poultices.

On careful examination no pulsation or *bruit* could be detected in the tumour; nor any pulsation in the arteries of the affected limb. The walls of the tumour appeared thick and sodden. Temperature of both legs being taken in popliteal space, the right one showed 98.4° F., and the left 98.8° F.—only $\frac{4}{10}$° difference.

Patient in a very feeble condition—was ordered stimulants and a liberal diet, and as he was restless at night morphia was required to produce sleep. Complaining of a great deal of pain in the tumour, warm fomentations were applied over the affected part.

Early on the morning of May 28th, the apex of the tumour presented a slight fissure, through which a segment of a small dark clot protruded. During the day this extrusion gradually increased and the fissure extended —until suddenly at 5 P. M. a rent, about two inches in length, opened; a handful of dark clots mingled with a small quantity of arterial blood was forced out. Dr. C. C. Lathrop, House Physician and Surgeon, with his Assistant Dr. C. W. Cropper, fortunately arriving at this juncture, the latter firmly compressed the abdominal aorta, and the former thrust a plug of lint into the opening. By these measures all hemorrhage was controlled until my arrival, when it was determined to pack the sac. The temporary plug having been removed, and the sac quickly emptied of the loose coagula, I introduced a tent of lint saturated with liq. ferri subsulph. into the opening of the external iliac artery, and then firmly packed the whole sac. There were used during the operation nearly one quart of the solution and more than three yards of lint. The pressure on the abdominal aorta was now cautiously removed, the packing was retained in place two hours by

digital pressure, and, as no further hemorrhage had occurred, a compress was placed over the distended sac, and this retained *in situ* by means of a roller bandage.

Although little blood was lost, the patient experienced considerable shock, from which he rallied in about five hours sufficiently to partake of nourishment.

May 29. Slept well during the night; is entirely free from pain, but complains of a complete loss of sensation in the right leg.

30*th*, 9 A. M. Temperature 101.5°; pulse 140. Passed a comfortable night. Sensation in leg is gradually returning. 11 A. M. Complains of some nausea. 6 P. M. Temperature 103°; pulse 160. Nausea increased till 5.30, when patient began to vomit—has ejected everything taken during the day. Feels weak and despondent. A dilute solution of carbolic acid is administered.

31*st*, 9 A. M. Temperature 102°; pulse 130. Vomiting entirely ceased and stomach tolerant of food. Sensation in right leg has wholly returned. General condition greatly improved, and patient more sanguine.

(My attendance on patient ceased this day; however, through the kindness of Dr. D. L. Reeve, who succeeded me as Visiting Surgeon, I was enabled to observe the further progress of the case.)

June 1, 9 A. M. Temperature 102°; pulse 120. Patient eats well and relishes his food. Complains of very little pain and fatigue, which he ascribes to the weight of the packed sac.

2*d*, 9 A. M. Temperature 102.5°; pulse 130. Passed a restless night, although he had taken his usual dose of morphia. Tongue furred and dry; appetite wanting; has some pain in right knee and also about sacrum. Is ordered five grains quinia three times a day.

3*d*, 9 A. M. Temperature 101.6°; pulse 120. Passed a quiet night; feels well; appetite has returned. Suppuration well established. Plug becoming more exposed to view on account of the disintegration of edges of the sac. The odour emanating from the tumour having become fetid, carbolic acid solution is directed to be sprayed over the sac.

4*th*, 9 A. M. Temperature 101°; pulse 118. Has been again suffering with nausea, the result of indiscretion in eating. A weak solution of carbolic acid has been taken with apparently good results.

5*th*, 9 A. M. Condition much improved. Sac suppurating freely but not profusely.

6*th*, 9 A. M. Temperature 100.5°; pulse 112. Appetite and general condition good.

7*th*, 9 A. M. Temperature 100°; pulse 104. There has been marked improvement in condition of patient during the past few days. Plug slightly movable, resting loosely in the sac, which is thoroughly syringed out with a weak solution of carbolic acid.

8*th*, 9 A. M. Temperature 99.5°; pulse 102. Complains of a peculiar feeling of numbness in the affected leg; sensation slightly blunted. Otherwise, improvement continues.

9*th*, 9 A. M. Temperature 100°; pulse 106. Plug very movable. Suppuration healthy, and granulations, which are gradually extruding the plug from the aneurismal cavity, can be observed springing up from its sides and bottom.

10*th*, 9 A. M. Pulse 120 and weaker. Strong pulsation observed in abdominal aorta just below umbilicus. Appetite slightly diminished. Tablespoonful brandy directed to be given every two hours.

Photograph taken at 3 P. M., from which the following wood-cut was prepared.

Fig. 1.

A. Plug. *B*. Dark line showing contour of the aneurismal tumour at the time of rupture.

11*th*, 9 A. M. Pulse 114. Condition less favourable. - Pulsation in abdominal aorta more tumultuous and forcible. Examined carefully, but no *bruit* discovered.

12*th*, 9 A. M. Condition same as yesterday. 4 P. M. Considerable hemorrhage occurred. Compression made over abdominal aorta gave patient intolerable pain. This not proving sufficient, the loose plug was removed quickly and the sac hastily repacked with dry lint. Apparently the source of supply for this hemorrhage rested at the bottom and lower part of the sac. It did *not* jet out, but appeared to "well up" as if from a vein. Patient greatly weakened and depressed.

13*th*, 9 A. M. Very weak. Pulse frequent and feeble. Complains of great pains in umbilical and sacral regions. Had a slight hemorrhage at 1 P. M. Twenty drops of laudanum were given with each dose of brandy.

14*th*. Condition very low; almost pulseless; eats nothing; stimulants increased. Slight hemorrhages occurred at 11 P. M., 3 A. M., and 12 M., which were controlled by pressure on aorta.

15*th*. Patient had a severe hemorrhage at 1 A. M., which was controlled with difficulty by the usual means. Died at 8 A. M.

Autopsy, made eight hours after death, revealed a large aneurismal sac, which extended upwards and covered, but did not involve, the right external and common iliac arteries.

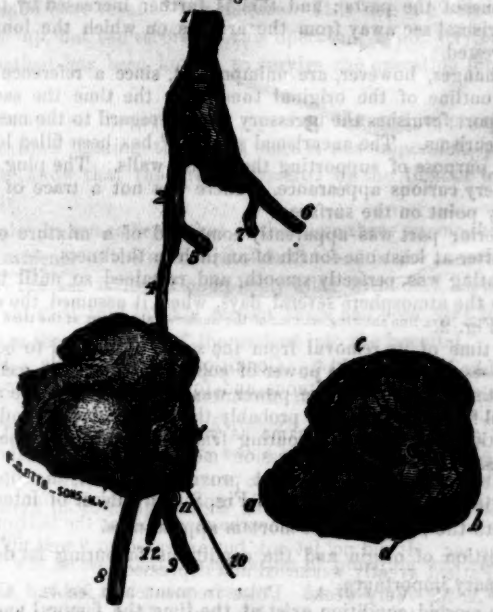
Further examination showed that the aneurism belonged to that class commonly described as sacculated, and was slightly conical and irregularly flattened. The long diameter of sac measured ten inches; the breadth, seven inches; and depth, two and a half inches. The interior of cavity

presented a continuous granulating surface. The walls were thickened and fused with the surrounding structures by means of inflammatory action. A powerful stream of water from the hydrant, being directed into abdominal aorta above smaller aneurism, had the effect of dilating this vessel to a marked degree—the left common iliac being compressed—no water entered the large sac. A similar trial in the case of femoral artery produced the same result.

A fusiform aneurism of the abdominal aorta, commencing about two inches above its bifurcation and involving the left common iliac as far as its division, was also found.

A considerable amount of laminated fibrin was deposited on the walls of this aneurism.

Fig. 2.



A. Femoral aneurism. *B.* Abdominal aortic aneurism. *C.* Plug. 1. Abdominal aorta. 2. Right common iliac. 3. Left common iliac. 4. Right external iliac. 5. Right internal iliac. 6. Left external iliac. 7. Left internal iliac. 8 Femoral. 9. Profunda femoris. 10. Deep epigastric (straw inserted into opening). 11. Internal circumflex. 12. External circumflex.

a. Cardiac extremity of first plug. *b.* Distal extremity. *c.* Top of plug. *d.* Bottom of plug.

The right external iliac artery was noticeably smaller than the left. The arteries being opened, the right external iliac was found to be completely occluded by a firm thrombus which extended from the aneurism to the origin of the artery—while the femoral was filled completely with a similar clot as far as the origin of the profunda femoris.

The deep epigastric was enlarged, and opened into sac on its external and lower surface.

The circumflex iliac was enlarged, and took its origin in upper part of aneurism. The superficial epigastric, superficial external pudic, superficial circumflex iliac, external circumflex, internal circumflex, and perforating arteries were all greatly enlarged. The arteries not having been injected, the anastomoses, unfortunately, could not be definitely determined.

The post-mortem appearances will be better understood with the aid of the wood-cut, Fig. 2.

This pathological specimen, very soon after its removal from the cadaver, was placed in a strong solution of alcohol, where it remained several days before the photograph was taken from which the wood-cut (Fig. 2) was prepared.

The first effect of this treatment was to diminish, in a very marked degree, the dimensions of the aneurismal sacs, and, secondly, a change in the relations of the parts; and this is further increased by turning the large aneurismal sac away from the arteries on which the long diameter naturally rested.

These changes, however, are unimportant, since a reference to Fig. 1 shows the outline of the original tumour at the time the sac ruptured, and the report furnishes the necessary data in regard to the measurements of both aneurisms. The aneurismal sac, "*A*," has been filled loosely with cotton for purpose of supporting the lateral walls. The plug, "*C*," presented a very curious appearance. There was not a trace of lint to be seen at any point on the surface.

The exterior part was apparently composed of a mixture of iron and animal matter at least one-fourth of an inch in thickness.

This coating was perfectly smooth, and remained so until it had been exposed to the atmosphere several days, when it assumed the appearance shown in Fig. 2.

At the time of its removal from the sac it was found to be very firm, and to possess a remarkable power of cohesion, which was seemingly due to the coating. This cohesive power was retained for some weeks after its removal from the sac, until probably the animal matter had undergone decomposition, rendering the coating friable, when the fragments of lint could be easily separated.

The aortic aneurism, as shown in Fig. 2, is a subject of interest in connection with the study of post-mortem appearances.

The question of origin and the conditions favouring its development are of primary importance.

Did this morbid condition exist at the time the femoral aneurism ruptured? I think not. At that time no symptom had ever been mentioned by the patient indicating any disease of the aorta.

The first indication of this lesion was observed on June 10th, thirteenth day after the rupture of the large sac, and five days previous to the patient's death. I am of the opinion, however, that this aneurism originated within forty-eight hours after the plugging of the large sac. The thoroughly debilitated condition of the patient was such as to predispose to this result; the pressure maintained on this vessel previous to and during the operation, with the mechanical action of the blood, were the principal causes of its production. The pressure was made with a roller bandage

in the hands of Dr. C. W. Cropper, who by steady and equable force controlled completely all hemorrhage. The injury to the artery, if any, certainly could not have been less, and the object sought accomplished by any other method.

The question may, perhaps, be asked—why some more modern means, as ligation, or galvano-puncture, were not resorted to in this case? Before answering this question, I would call attention to Fig. 1, and also ask reference to the description of the aneurism at the time the patient presented himself for treatment in the hospital. The description, aided by the illustration, surely cannot fail to satisfy the most skeptical that an attempt to tie either the external or common iliacs, without first opening the sac, would have resulted in a failure. It is true the aorta could have been taken up, but the record of this operation is not very encouraging, since no patient has been known to survive the operation for more than ten days.

The attempt at ligation, after opening the sac, appeared not less formidable than ligating the aorta, since it was impossible, prior to the autopsy, to know that the arteries covered by the tumour were not involved in it.

It will also be remembered that at this time there was neither pulsation nor other evidence of the existence of fluid blood in the aneurism. A few days later, the sac is found completely filled with dark clots, and I am now fully satisfied that in this respect there had been very little, if any, change since the admission of the patient into the hospital.

Again the semi-gangrenous condition of the covering, and the coagulated contents of the aneurism forbade the galvano-puncture, or the use of compression in any form. Although this condition of the contents aroused the vain hope that there was a possibility of a spontaneous cure, yet, we fully realized the insecure character of the basis of our hope, since we were in total ignorance as to the origin or duration of this solidification.

Thus, it will be seen that the operation of plugging was not performed from choice, but as a *dernier ressort*. As this operation is not even mentioned in many of the modern works on surgery, I have thought it desirable to give so much of the literature as I find readily accessible.

M. Lisfranc, writing in 1835, says:—

"The means applied in this method are as follows: the controlling of the blood by compression above the aneurism; the opening of the tumour; the removal of the clots; the insertion into the opening of the artery of *carton maché*, agaric, or dossils of lint powdered with astringents; the employment of compresses saturated with aromatic spirituous liquids; the application of a roller bandage, and the continued use of the tourniquet. Although Guattani is reported to have thus cured an aneurism of the external iliac (artery), although the use of the tampon has saved the life of a *sick woman*, in whom a surgeon had opened an inguinal aneurism, this means should almost always be rejected; it can be *useful* only when there is *no other* to replace it. It

must, in fact, be *almost always* followed by consecutive hemorrhages, inflammation, very abundant suppuration, and gangrene."[1]

Prof. William Pirrie, writing on the surgical treatment of aneurisms in 1860, says:—

"Another operation, practised by Guattani and others, consisted in laying open the sac, removing its contents, and applying graduated compresses to the extremity of the artery at the mouth of the sac. In performing this operation, some surgeons, among whom was Guattani, endeavoured to arrest the hemorrhage by pressure alone, using compresses for this purpose; others, retaining the use of compresses, also applied styptics."[2]

Mr. John Erichsen, discussing the means used in controlling hemorrhages from aneurismal cavities, says:—

"If hemorrhage have already supervened, the case is attended with immediate danger. In such a case as this, the first indication is clearly to arrest the immediate flow of blood, so as to prevent the patient dying at once. This can be best accomplished by turning out the coagula and plugging the sac with lint or compressed sponge, retained *in situ* by a firm, graduated compress, and well-applied roller. The hemorrhage having thus been arrested for a time, the surgeon should take into consideration what steps should be adopted permanently to restrain it. In some cases, indeed, though these are exceptional, the plug and compress may be sufficient to prevent a recurrence of the bleeding; but in general it will not do to trust to these means unless the anatomical relations of the part be such as to preclude the possibility of adopting any more active measures."[3]

Prof. Velpeau, referring to the means used to control hemorrhage of arteries accidentally opened, says:—

"It often happens, that surgeons find themselves so situated as to render it impossible for them to tie an artery which they have opened either by mistake or design; in such cases it is their usage, in order to save their patient from death, to plug up (tamponner) the wound, and compress the vessel by applying to it, directly, the different substances eulogized by Trew, Teichmeyer, etc. This method, besides being much less frequently employed than indirect compression, possesses in fact much fewer advantages, and ought, at the present day, to be wholly rejected: some success has nevertheless been imputed to it."[4]

The objections urged by Lisfranc, in 1835, the date of the publication of his monograph "On the different methods of procedure for the obliteration of arteries, their respective advantages and inconveniences," were entitled to more weight then than at the present time.

Prof. Jos. Lister's antiseptic system of treatment might be reasonably supposed to modify his views in regard to inflammatory action.

It is evident, from the manner in which Lisfranc speaks, that he had never attempted to perform the operation, and neither is there any proof that he ever saw a case in which it had been resorted to. He says: "It must, in fact, be almost always followed by consecutive hemorrhages, in-

[1] Des diverses méthodes et des différens procédés pour *l'oblitération des artères*, de leurs avantages et de leurs inconveniens respectifs. Bruxelles, H. Dumont. Londres, Dulan et Compagnie. 1835, p. 33.

[2] Principles and Practice of Surgery, p. 519, Second edit., London, 1860.

[3] The Science and Art of Surgery, p. 505, Amer. edit., Phila., 1859.

[4] Operative Surgery, Edited by Mott, vol. ii. p. 59, N. Y., 1851.

flammation, very abundant suppuration, and gangrene." Whether these serious results will follow in the plugging of aneurismal sacs will depend on the following conditions, viz.: the general condition of the patient; the local condition of the diseased parts; the thorough or careless manner in which the sac is plugged, and the after-treatment of the case.

Let us now turn our attention to the subject of inflammation, and suppuration, and the dangers to be anticipated from this source. Are the tissues of the sac of such a character that they will be readily destroyed by suppuration?

It will be remembered, the interior of the sac of a *true* aneurism is composed of the walls of the artery; and the exterior, of such tissues as may have become agglutinated, to the interior, by inflammatory action; while the interior walls of a *false* aneurism—although not formed from the artery—are almost identical in structure. My observations lead me to suppose the interior walls of aneurismal sacs will act in nearly the same manner as the arterial tunics. Prof. S. D. Gross, referring to the diseases of arteries, says: "The arteries are almost insusceptible of *gangrene*. Their conservative powers are certainly very great, as is evinced by the fact that they often escape destruction in the midst of parts that are perfectly deprived of vitality. In such cases, their outer surface is incrusted, at an early period of the disease, with a thin layer of fibrin; and, long before the sloughs begin to separate, the blood coagulates in their interior, thus opposing an effectual barrier to the occurrence of hemorrhage."[1]

Prof. John Erichsen says: "The *ulceration* of arteries, though frequently spoken of, in reality seldom occurs."[2]

It is a fact well authenticated that arteries in the lungs are frequently found traversing cavities separated from the surrounding tissues, and resisting the disintegrating action for a long period. These arteries are found obliterated and diminished in size and capacity. I have seen the femoral artery in Scarpa's space separated from all the tissues; the sheath even having opened, and three inches of the artery freed from all its natural surroundings; and this part remained in the same condition for several days, and then the granulations sprung up from the bottom of the ulcer, crossing the vessel without having interfered in the least with its functions. "Dr. John Thomson declares that he has seen cases of phlegmonous erysipelas, in which 'several inches of the femoral artery were laid completely bare by the gangrene, ulcerations, and sphacelus of the parts covering it without its giving way before death.'"[3]

In the case of the patient recently treated, the suppuration was less than

[1] System of Surgery, vol. i. p. 662, 4th ed., Philadelphia, 1866.

[2] Ibid., p. 480.

[3] Watson's Practice of Physic, edited by Condie, p. 144, new Am. ed., Philadelphia, 1858.

I have ever seen it where the same preparation of iron had been used over an equally large surface.

It is true the integument which was in a semi-gangrenous condition when the sac ruptured, became gangrenous and separated from the living tissues by the ulcerative process, but the interior preserved its vitality.

Again, it will be observed that the directions given by Lisfranc refer simply to plugging the sac, but nothing is said by him about plugging the artery. The former operation is open to objections, from which, however, the latter would be free.

I will, therefore, venture to propose the latter as a substitute for the former.

This I conceive to be the most important step in the whole work, and should be performed with great care and accuracy.

Before the aneurism is opened, tents of proper size and suitable material should be prepared with a strong ligature attached to the base for the purpose of facilitating their removal. These ligatures should be brought outside of the sac after the tent has been firmly introduced into the opening of the vessels. A very desirable tent could be made with the rubber now used in making rubber stoppers.

I have, in cases of emergency, made very satisfactory tents of charpie, by placing a flexible wire in the centre, where flexibility was desired, and in other cases where it was not required I have substituted wood. The charpie is placed about the wire or wood, then firmly wound around with a silk ligature, considerable care being required to bring it to the proper size and form.

Having thoroughly plugged both the cardiac and distal openings in the sac, the sac itself may be packed with lint or other material, in case there is still some hemorrhage, but in the large majority of instances, I think it will be unnecessary. The hemorrhage will be as securely controlled by the use of these tents, providing they are properly prepared and securely introduced, as could possibly be done with a ligature.

The advantage of plugging the artery instead of the sac is this: the local circulation is not interfered with in the same degree, and the nutrition of the parts is proportionally better. It will be seen at a glance, that, when the sac is plugged with sufficient firmness to control the hemorrhage in a large vessel, it must necessarily put the sac and surrounding integument on the stretch and keep it in this condition; thus favouring death of their parts, while the other plan of treatment cannot be open to this objection. I now incline to the opinion that this method of procedure may be found useful not only in cases of the same character as that reported, and in cases of accidental opening of large vessels, but may be applied in the treatment of aneurisms of the extremities with or without the use of Esmarch's bandage; but I should favour a strict adherence to Prof. Lister's antiseptic mode of operation and after-treatment.

ART. VII.—*Extraordinary Case of Intra-cardiac Cyst.* By EDGAR HOLDEN, M.D., of Newark, N. J.

IN view of the vagueness of the prevalent idea concerning heart-clot and polypus of the heart-cavities, it is not surprising that the fibrination due to the churning of the blood in articulo-mortis, or the coagula post-mortem, should be mistaken for veritable polypi.

The following case, copied from notes taken at the time of attendance, and verified by autopsy, will perhaps prove of interest, especially as the remarks of Rokitansky, vol. iv. p. 167, quoted below, seem almost as though written for this particular instance:—

A. B., æt. 35, a stout, robust, and healthy man, but somewhat given to excesses, while making his toilet on Monday morning, April 10, 1876, fell to the floor in a state of unconsciousness, with an involuntary evacuation of the bowels. Called immediately, I found the patient fully conscious, but fainting upon the least motion of head or even hands. No pulse at the wrist, and the heart beat so rapid as to seem almost like a continuous thrill, but regular and of even force. Temperature 99°. Believing the attack to be one of acute palpitation from use of strong tobacco, from which he had once before suffered, antispasmodic and stimulant treatment was resorted to, with such apparent success, that on the next day he was able to sit up, and even to go out for a walk.

April 12. At 5 A. M. occurred a sudden relapse, faintness, no radial pulse, no carotid pulse, contracted pupil, indescribable agony, yet with no pain. Anodynes, antispasmodics, hot douches, and stimulants gave but slight relief; an emetic of mustard water gave a little ease, and placing the head lower than the body, to favour cerebral circulation, was also beneficial for a brief time. Temp. 99°.

13*th*. No improvement, no rest or sleep. I succeeded in counting the heart-beats, and after several attempts verified the count at 204. Respiration normal. Ice to the spine, Hoffmann's ether, strychnia, etc., producing no effect, and the rhythm of the heart being unaffected, ventured next day to give digitalis in small doses with musk, but was speedily admonished, by the increased suffering of the patient, to discontinue.

14*th*. No improvement, great jactitation, constant and indescribable agony, no pain, head still clear, bowels and kidneys free, no voluntary evacuation since the first day. A consultation was now held with Dr. Southard, and bromides resorted to in large doses, but with no effect. As no effect followed any medication, all allusion to subsequent treatment will be discontinued in the report. *No sleep now for six consecutive days.* Morning temperature 101°; evening 100°; heart-beat 216; respiration 14 per minute. (See record on chart, next page.)

16*th*. Stertor; involuntary evacuations, and for the first time a subdued friction sound over the base of the heart. Morning temperature 97°. Evening 97°. No delirium, less tendency to syncope; raised up without increased suffering; no dyspnœa.

17*th*. Morning temperature 96.5°. Evening, 97°. No other change.

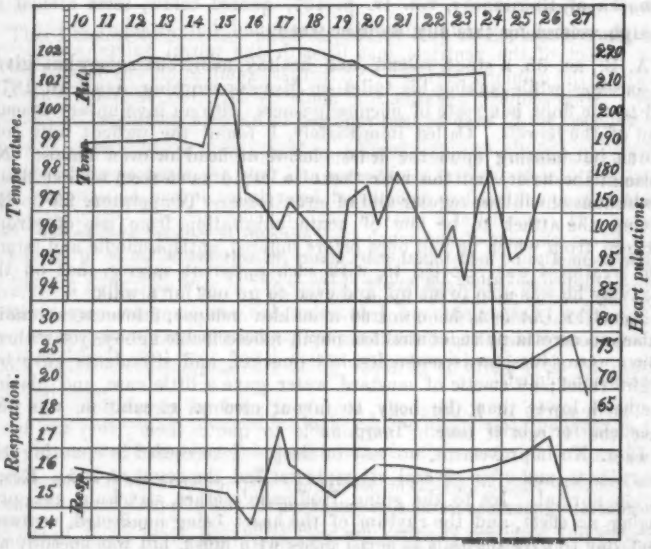
18*th*. Temperature, A. M., 96°. A flutter-pulse at wrist; quiet sleep; easy respiration, but sighing; pulse (by counting over the heart) 220; face flushed; feels better.

19*th*. Temperature, A. M., 95°; P. M., 97.5°. Supposed effusion; the heart beats seeming slightly muffled; faintings frequent, even without exertion.

20*th*. Skin cold; heart-beat slower; patient drowsy; friction or churning sound at base; temperature, A. M., 97°; P. M., 96.25°. A grain of opium every hour appeared to relieve the peculiar agony from which he has suffered, but the skin has become cold and clammy; intellect still clear.

21*st*. Condition unchanged, except that the surface of the body has become extremely sensitive; patient screams if touched.

A. B——s, æt. 35, male. Newark, N. J., April, 1876.



22*d*. Left side of body somewhat purple, and left foot cold, but acutely sensitive; muttering delirium.

23*d*. Foot completely dead, and black as high as two inches above ankle.

24*th*. Being the fourteenth day of the disease, the pulse suddenly at 2.45 P. M. became normal, dropping at once from above 200 to 75, at which rate it continued, or nearly so, until death, four days later.

The following brief notes complete the case:—

25*th*. Raved all night; throat sore; tongue dry; petechial eruption on chest and limbs; flushed face, and appearance of emaciation so astonishing in its rapidity as to excite the attention of friends and attendants; pulse and respiration normal; temperature 95°.

26*th*. Same condition, but raving frantically; easily rallied, however, when spoken to, and answering questions intelligently; complains of great pain in the back of the head. Paraplegia, with involuntary evacuation of bladder and bowels. Intermittent respiration; intervals of sixty to

ninety seconds between breaths; pulse singularly even, strong, and regular. Death on the 27th of the month, and 17th of illness.

Autopsy, sixteen hours after death. Present, Drs. Southard, E. A. Osborn, Bleylie, Haight, Burrage, and Holden. Body rigid, of strongly cadaverous odor, and threatening rapid decomposition. The mortified foot somewhat reddened; lungs normal; pericardium somewhat reddened about the efferent vessels; effusion within slight; heart somewhat loaded with fat; apex and base, together with two inches of the aorta externally injected; right auricle and ventricle slightly dilated; left ventricle normal, save that within it and lying entangled in the chordæ tendineæ was a cyst, the size and shape of a large filbert, entirely detached and empty. The position and character of this were verified by the gentlemen present, before removal.

Upon searching carefully, another was found, but attached to the anterior aspect of the ventricle, just beneath the mitral valves, and bound down by the columnæ carneæ. No further examination was deemed necessary. Microscopical examination, made by Dr. Geo. A. Van Wagenen, of Newark, N. J., may be best reported in his own lanaguge.

"I have examined the small cyst from left ventricle of heart. The tissue composing its walls does not resemble that of a fully organized cystic tumour. I could find no epithelial or endothelial layer lining it, and no signs of blood-vessels. It consisted of a mass of small, round, ovate, and caudate granular cells, about the size of, and much like, pus-cells in general appearance. The whole seemed to be held together by a very delicate reticulum of fibrous tissue, which cropped out along the edges of the specimen. In some places organization had gone so far that the tissue was partly striated. The whole appearance resembles that which is found in a fibrinous clot undergoing some organization. I think it comes fairly under what Laennec has described as globular vegetations. There were a few fibres floating free, which I had torn from the edges of the specimen mounted."

The remarks of Rokitansky, already alluded to, so aptly describe this case, that I trust it may be pardonable to quote them; they are as follows:—

"*Globular Vegetations.*—The formations distinguished by this designation are generally round concretions, varying from the size of a pin's head to that of a nut, attached by means of ramifying, cylindrical, or flat appendages or bands, which entwine themselves among the trabeculæ of the heart, and are of a more or less uniformly dirty, grayish-red, or white colour. They are hollow in the interior, but contain, within a wall of irregular thickness, a dirty, grayish-red, or even chocolate-coloured thickish fluid, resembling cream or pus, and which is occasionally of a dirty whitish or yellor colour. One or more of these concretions very frequently burst, when the fluid may be seen effused into the cavity of the heart, and distributed over the recent coagula which have been formed either in the death-struggle or shortly after death, or it is found mixed with the fluid blood contained in the cavity. The band-like appendages which they throw out are either solid or softened and liquefied in their interior.

"The globular vegetation is originally a solid fibrinous coagulum of irregular form, which varies in colour according to the number of blood-corpuscles it contains, from different shades of red to a reddish-white colour. This coagulum gradually assumes a roundish form, probably in consequence of the outer portion being taken up in the blood in a finely comminuted state. The metamorphosis which it undergoes is very important, and begins as a softening disintegration or solution in the interior of the nucleus, from whence it extends towards the surface. This process is so far developed in the globular vegetations above described, that there only remains a peripheral layer, which incloses the dissolved part as in a capsule. The soft and diffluent mass consists, as has

been already remarked, of a pulpy, cream-like fluid, very often resembling pus, and of a chocolate, or dirty brownish-red, reddish-gray, pale-yellow, or whitish colour. A similar metamorphosis affects the ramifying band-like coagula, proceeding from the vegetations when they become hollow. The same process is occasionally discernible in the central layers of those coagula of the first form which have arisen during life. We sometimes observe in these coagula a tendency to decomposition, both by their turbidity and opacity, their dirty-yellow colour, their extreme lacerability, and by the appearance of a turbid cream-like moisture when they are compressed and torn.

"It is a remarkable circumstance that globular vegetations are almost always limited to the left ventricle, where they are attached, in the manner already described, to the apex and the contiguous parts."

Remarks.—The summing up of this typical instance of true globular vegetation in the ventricles, gives us the following symptoms, viz.: Protracted functional derangement of the heart for a year, without murmur or impairment of rhythm or impulse, and attributed to strong tobacco; sudden syncope, and brief loss of sensation and motion; intensely rapid pulsation of the heart, with incapacity to maintain arterial and capillary circulation; cerebral anæmia and insomnia; frequent faintings, first upon slight motion, and later, without; remarkably low temperature; singularly unimpaired respiration-rate; sudden dropping of pulse-rate from above 200 to a normal state, both as to frequency, tension, and rhythm, and its continuance up to the hour of death; intense hyperæsthesia of the surface of the body; embolism of the popliteal artery, with death of the limb; clearness of intellect through all, till almost the last day; and, finally, paraplegia and death.

Whether any more reasonable explanation might be offered in this case than the following, it is impossible to say, but it seems to me that the existence of the cysts following a forgotten endocarditis, would be adequate cause for the functional prodromata; the sudden detachment of one, and the repeated plugging of the aorta at each systole of the heart, would explain the syncope and the excited and intensely rapid beating, while the entanglement of the cyst in the trabeculæ where found, might explain the sudden fall to a normal rate. The protracted disturbance of nutrient supply to the brain, and irritation of the pneumogastrics as well as the central sympathetic ganglia, would in a measure account for the vasomotor derangement, the cutaneous hyperæsthia, and the low temperature; embolism of the popliteal, and later, of more important arteries, would be a not-unlooked-for complication.

ART. VIII.—*Thrombosis of the Right Ventricle, extending into and occluding the Pulmonary Artery, consequent upon Rheumatic Inflammation; Chorea; Convulsions; Death.* By A. B. ISHAM, M.D., Cincinnati, Ohio. (With two cardiographic tracings.)

SOME writers have endeavoured to found a distinction between ante- and post-mortem clots upon a difference in colour. But as coloration depends upon the uncertain chances of position of thrombus, imprisonment and retention of red blood corpuscles between the fibrinous layers, and of hæmatin staining, it is obvious that variations in shade from red to colourless afford no true basis for discrimination. Very little more reliance can be placed upon the consistence of the clot. In proof of this assertion it only needs reference to the experiments and observations of Zwicky, Stilling, and Durante upon the production of arterial thrombi. The results of their investigations upon the process of coagulation in the vessels of living animals also largely disarm the opponents of spontaneously formed fibrinous concretions in the heart during life, who adduce the occurrence of such clots found after death from causes with which they could have had no connection. Only, further, it would seem, to render the work complete, is it essential to show an application to the living human subject. Of this we are furnished abundant evidence, notably by Virchow, Richardson, and Fayrer, of persons seized with marked symptoms of cardiac disturbance in which the autopsy furnished these concretions within the heart without any sign of other lesion of fatal import.

The following case is offered as well illustrating the clinical history of thrombic formation within the heart and pulmonary artery, and as interesting, furthermore, from the relation it sustains to that form of choreic manifestation incident upon anæmia of the central nervous system due to obstruction of blood supply, as indicated by a study and comparison of cardiographic tracings:—

M. B., æt. 13, first seen Nov. 4th, 1875, suffering from rheumatic inflammation, with swelling of right ankle-joint. Temperature 102.2°; pulse 112.

5*th*. Condition about the same; temperature 102.6°; pulse 115.

6*th*. Temperature 103.2°; pulse 125; a plain systolic endocardial murmur, not possible to localize, developed. Choreic movements of left side commenced, manifested by tossing of left arm and leg. Spasm of muscles of left side of face. Mild hysterical form of delirium. Chloral given, under the hypnotic influence of which the choreic movements were suspended.

7*th*. Temperature 100.4°; pulse 130; chorea general and violent; constant and forcible tossing of limbs, bouncing of head and body, incessant champing of lower jaw and working of tongue; pupils dilated; harsh, dry cough; foaming at the mouth and spitting tough, frothy mucus; general venous fulness and duskiness of skin; no sign of con-

sciousness. Murmur continues. Kept under influence of chloral all the time, gr. x of which drug insures a quietude of one hour. Ordered also potass. iodid., gr. v every three hours, on noticing that a peculiar accent of the father arose from loss of soft palate and partial loss of vomer.

9th. Temperature 100°; condition about the same as day previous; murmur softer. Dr. A. E. Jones in consultation. Treatment continued.

10th. Temperature 102°; pulse 132. Dr. Keyt kindly visited her with me, and with his sphygmograph obtained the cardiogram which will appear further on. The murmur continues well marked, soft and purring, systolic, diffused, not to be certainly localized but rather more accentuated at left base and beyond to the left. As the father, who was strongly prejudiced against chloral, vehemently objected to its use, and as the patient was now semiconscious and the chorea much moderated, the chloral was suspended and potass. bromid. substituted. On the 11th, 12th, and 13th the muscular movements were much quieter. There was so much motion, however, that, under the bar of hypnotic aid, the pulse and temperature could not be taken. At times she was perfectly intelligent, alternating with intervals of seeming hysterical delirium. Took nourishment well; bowels regular. Feces and urine passed in the bed. On the 14th the movements again became violent. Without restraint, the patient would be bounced from the bed. She was several times thrown upon the floor. The various antispasmodics had no effect. On account of the objections to chloral, hypodermic injections of morphia were resorted to. Injections of gr. $\frac{1}{4}$ were made at intervals of half an hour until gr. j had been introduced, without the slightest perceptible effect. After another trial of hypnotics and antispasmodics, the movements increasing in power, on the evening of the 15th I injected at short intervals in increasing doses until gr. $1\frac{3}{4}$ of morphia had been administered, with only the very slightest effect. Returning at 11 o'clock at night, the bed was found broken down by the combined spasmodic action of the patient and the mother's endeavours of restraint. I remained until after two o'clock of the morning of the 16th, when she was left fairly quiet under the influence of chloral surreptitiously administered. On the morning of the 16th, shortly after 9 o'clock, on making my visit, the mother came rushing wildly out into the yard to meet me, saying her daughter was dying; that a moment since she awoke, asked her to bring a drink of water, and immediately after partaking of it a fearful spasm seized her. On my entrance, the body presented resting on the occiput, elbows, and heels; eyes open and staring; hands tightly clenched; dead.

Autopsy, twenty-nine hours after death, conducted by Dr. L. R. Longworth; present Drs. A. T. Keyt, A. E. Jones, and myself. Body straight. Cadaveric rigidity perfect. Marked general post-mortem discoloration. Deep reddish-brown circular spots, from three lines to half an inch in diameter, scattered over surface, more especially on chest, back, and face. Over the upper part of right scapula were ten or twelve irregularly dispersed slightly depressed cicatrices, and from a line to three lines in diameter. Abdominal section revealed all the contents normal, with exception of liver, which was slightly congested and showed two yellowish-white patches, the size of a pea, just beneath the capsule—one upon the anterior upper surface and the other situated in the right lateral inferior aspect. In the chest the lungs were healthy, but the left lung contained a calcareous nodule the size of a filbert. The lungs were entirely free from any appearance of congestion. In the right ventricle of the heart, reach-

ing into and filling up the pulmonary artery, was a firm, slightly adherent, perfectly decolourized clot two and one-half inches in length; and in the left ventricle was a very small yellowish-coloured clot of softer consistence. The heart returned no evidence of lesions of valves or substance. The brain and spinal cord and their investments were normal, but contained a large amount of serous fluid, bathing everywhere the convolutions, and which, upon the removal of the calvarium, gave the brain an appearance of being too large for its cavity. It was what has been termed a watery brain.

The first in order of clinical phenomena is the rheumatic inflammation of the ankle-joint. Then follows an endocardial murmur, with limited muscular spasm and intellectual derangement at first, passing into general convulsions and coma, as a result of thrombosis in the right heart, the consequence of the well-known hyperinosis of the blood in rheumatism. Richardson and others differentiate symptomatically between thrombi of the right and left heart. Convulsions and coma are assigned prominently to fibrinous deposits in the latter, while restlessness and delirium are put down as belonging more particularly to the former. But these are tokens rather of degree of obstruction of the blood current through the heart than of place. The experiments of Astley Cooper, Kussmaul and Tenner, Brown-Séquard and others, show that the deprivation of the arterial blood supply causes these manifestations, occurring, as they may, from direct obstruction to the onward flow in the left ventricle, or from pressure backward in the venous trunks by obstruction seated in the right heart.

No. 1.

No. 2.

It is here that the cardiograph becomes of practical utility. Cardiogram No. 1, obtained by the sphygmograph of Dr. Keyt, which is a perfect cardiograph as well, strikingly exhibits an impediment in the central circulatory apparatus by the disproportionate length of the ventricular systole and the shortness of diastole as compared with a normal heart tracing in No. 2.

No. 1 is the heart tracing of the case forming the basis of this paper,

taken on the 10th of November, when the patient was quiet under the influence of chloral. No. 2 is that of a healthy lad, aged seventeen years. The space between the dotted vertical lines, *a*, *a*, is the length of the ventricular systole, and the space between the dotted vertical lines, *b*, *b*, is the length of the diastole. The plain vertical lines at the extreme right and left of the tracings represent by the space between them the run of the stage in five seconds of time. By examination of the normal cardiogram No. 2, it will be observed that the systole occupies just one-third of the entire cardiac revolution, while the diastole takes the other two-thirds. Cardiogram No. 1, on the other hand, gives to the systole more than one-half (four-sevenths) of each heart round. Of what pathological significance was this abnormally long systole? Plainly, it indicated that there was resistance to free ventricular discharge, and the thrombus found in the right ventricle and pulmonary artery, in the absence of other lesion—of valvular insufficiency, of valvular or arterial stenosis—reveals beyond question, to my mind at least, the secret of that resistance. That it was not due to the small clot in the left ventricle, which was undoubtedly a post-mortem change, is proved by the condition of the lungs. In such event, these organs would have been markedly congested. Tracings of aortic stenosis show the same lengthening of the systole, not so great, however, as in No. 1.

The condition of the brain from the impediment in the heart was that of anæmia. This is disclosed by the watery infiltration discovered post-mortem. The venous blood dammed back from the right side of the heart transuded into the brain substance, compressing the vessels and giving origin to the choreic outbreak. It can be attributed to nothing else. There was no connective tissue hypertrophy, and therefore no sclerosis of gray matter.

The murmur heard in this case corresponds with that described by Walshe and others as occurring in thrombosis or embolism of the heart. Alone, it is of value only as pointing to the seat of the trouble, but taken in connection with the cardiograph, the nature of the lesion may be diagnosed. Walshe has also pointed out how the murmur may disappear and reappear according to the position of the clot. As an instance of how theory may lead one astray from a correct appreciation of murmur, we may cite a case reported by Dr. Balfour in the *Medical Times and Gazette* for December, 1874, in which, to give support to the view of Quincke, of Berlin, of systolic pulmonary murmur from insufficient lung expansion over the pulmonary artery, he entirely overlooks the decolourized clots found in all the chambers of the heart, and completely filling up the pulmonary artery.

In regard to the closing scene. It is in perfect accord with the march of pathological events—first a plug in the right heart, then extending into and suddenly blocking up the pulmonary artery. Not more surely would

hanging produce strangulation, and not more surely in one case than in the other would the deprivation of the blood supply to the muscles excite in them tonic spasm.

WALNUT HILLS, Cincinnati, Ohio.

ART. IX.—*Case of Rupture of the Uterus; remarkable for its comparative causelessness, so far as known, and the Absence of the usual Antecedents.* By ISAAC G. PORTER, M.D., New London, Ct.

APRIL 10, 1875. Called at 7 A. M. to Mrs. G., residing four miles distant; æt. thirty-nine years; mother of three children, the youngest born two years since. Having been with her at that time, and also at the preceding birth, I can testify that her labours were short, and in every respect favourable. There existed, however, a constitutional tendency to obesity and relaxation. Found, on arrival, that her pains, which had been slight, had subsided, and after waiting an hour, an examination was instituted to learn the condition and progress of the labour. It was with difficulty that the os uteri, which was closed, could be reached, so high was it in the vagina. Anterior obliquity was strongly marked. The day having passed without pain, I was again summoned in the evening, arriving between 8 and 9 o'clock. The labour was far from active, indeed, another false alarm was anticipated. The position of the uterus was as before described, the os being slightly dilated, and still reached with great difficulty, owing, as I thought, to extreme anterior obliquity. To remedy this, a finger was inserted within the os, and slight traction made to draw it forward, while lifting efforts with towels beneath the abdomen, externally, were carefully made, the patient lying on her back. At 10 o'clock the pains became somewhat more active, but were far from satisfactory, and so continued until 11.30 P. M., when, for a few minutes, they became strong, being aided somewhat by voluntary efforts, but not violent. So little benefit did I expect from them, that, to avoid unnecessary assistance and to abridge the tedium of waiting, I was sitting in an adjoining room, the connecting-door being open, when the attendants came rushing in, saying that something had burst in her last pain and that she was in great agony. I found her countenance greatly changed, hands and feet bathed in a cold sweat. The pains had ceased, of course, and there was slight flooding. A vaginal examination revealed a large rupture of the cervix, the hand readily reaching the head of the child, while the body was still covered by the uterus. A consulting physician, Dr. R. A. Manwaring, soon arrived, and it was thought advisable to deliver by turning, which I accomplished with little difficulty; the child, however, being dead. The placenta soon followed, and the patient rallied fairly, and subsequently gave some promise of recovery. She died, however, on the fourth day. The child, I may add, was not disproportionally large.

Two years before, as stated, after an easy labour, she was delivered of a full-grown child. Is it probable that, within the period named, any permanent obstruction could have formed to prevent the descent of the

head at the superior strait? In Dr. Trask's series of cases, anterior obliquity is only once assigned as the cause of the accident. Doubtless, anything which impedes the course of labour exerts an influence in favour of rupture. In an entirely healthy uterus, the existing obliquity may not have been adequate to produce the result; but it is not so when conjoined, as it may have been in this case, with fatty degeneration, friability, atrophy, or thinning—causes, all of which are usually recognized in most treatises on this subject, and particularly by Drs. Murphy and Trask. It is to be regretted that, through distance and other unpropitious circumstances, no post-mortem examination was made.

The case is remarkable in its sudden and unexpected termination, which was truly appalling. True pains, which were never violent, occupied but little over an hour, cutting themselves off suddenly, as if conscious of utter incompetency. So far as known, the rupture may be said to have been, etiologically, idiopathic and almost spontaneous.

The foregoing history was recently (July 20) forwarded to Dr. James D. Trask, as appropriate to his forthcoming supplement to his valuable labours on this subject. I regret to say that his family have returned the same to me, as requested (after taking a copy), with the information that the doctor is absent, being compelled by ill health to cease work, and that the promised article is not ready. An opportunity is thus afforded for an additional observation.

It is well known that a more limited view of the causes of this accident than this case would seem to authorize, is maintained by Bandl and others. His conclusion, as drawn from thirty-two cases as observed by himself, and as taken from the records of the Vienna Lying-in Hospital, is as follows (I quote from the last No. of this Journal, p. 289): "He has not found, in one single case, that pathological change in the substance of the uterus, which has so generally been assigned as a predisposing cause, more especially in multiparæ. The uterus was always thick, well contracted, high up, and the cervix very thin." . . . "The fissure was nearly always found in the cervix." . . . "He believes the rupture is always due to disproportion, and agrees with Chiari, Braun, and Spaeth, in considering that the abnormality is due to an excessive thinning of the cervix, occurring during labour." . . . "In normal circumstances the cervix is drawn over the head of the child by the muscular uterus; the *orificium internum* remaining about on the level of the brim of the pelvis. If there is a disproportion, which does not allow the presenting part to descend into the pelvis, the cervix is abnormally stretched," etc. "He believes that rupture can be recognized as threatening, when the internal orifice gradually ascends, whilst the cervix stretches, and the fundus acquires a lateral position."

The foregoing rationale is entirely unsatisfactory, as applied to the case before us. The "lateral," or anterior obliquity of the uterus existed at the outset, and was not the product of labour, and yet, doubtless fur-

nished a part, or the whole of the "disproportion" claimed as necessary. It was not as excessive as sometimes noticed where the evil has been overcome without great difficulty, and yet its action alone was, probably, inadequate to the result.

As to the thinning of the cervix by the force of labour, in this case the stress, violence, and continuance of the latter were entirely inadequate to produce so grave a pathological condition. Very probably such thinning existed, but it must have originated prior to labour. Besides, we are often informed of cases where the rupture occurred in the "fundus," or "body," of the uterus, as shown by the autopsies.

As a practical appreciation of the foregoing, may we not deduce the principle, that "anterior obliquity" may constitute, in certain relations, a more serious obstacle to delivery than is usually taught, or believed?

ART. X.—*A Case of Splenic Leucocythæmia, exhibiting marked temporary improvement.* By F. C. CURTIS, M.D., of Albany, N. Y.

THE following case of an uncommon disease presents some unusual symptoms which render it of sufficient interest to be placed on record:—

The patient, Daniel W., aged 39, a native of Albany, a fish-curer, with a family history clear with the exception of rheumatism, had an attack of rheumatism himself at the age of sixteen, and again another a year later. No heart complications were noted. With this exception he had always been healthy. At the age of eighteen he went West, and for four years was in the region of the Mississippi, up and down the river, much of the time in malarial districts, but, as far as he knew, never was affected with any malarial disease. His early life was rather irregular, but for a number of years he has been a sober, quiet, domestic man.

Four years ago he began to have night-sweats, which continued up to the advent of more urgent symptoms, within a year, with considerable constancy. Sweating took place almost every night, and was often very profuse. His skin became sallow, and he rather lost strength, although able to work until within a year of his death. He was of spare habit, and did not emaciate then or subsequently to any marked degree. His appetite was variable, but fair. He applied for relief of his night-sweats, and the usual round of remedies was tried, all having a temporary effect, and all failing eventually. There was no material change in his symptoms until a year previous to his death. Then he began to experience a dull, heavy feeling in the left hypochondriac region, increased by lying on the left side. Œdema of the feet also came on. In March, 1875, a protrusion of the cartilages of left lower ribs was noticed, and in May this grew so marked that he came to the office for examination. It was found that this side of the abdomen was occupied by a smooth mass, reaching fully to the median line at the umbilicus, the edge being sharply defined, and rounding off below into the pelvis, the upper limit being found by

percussion to reach about to the sixth rib. The outline of the tumour was quite appreciable on inspection alone, the abdominal walls being thin. There was no tenderness on pressure over the mass, and its surface was perfectly smooth. The lymphatic glands were nowhere enlarged. Examination of the blood microscopically showed the number of white blood-corpuscles to be largely increased.

Various remedies were tried. In addition to a general tonic, quinia, which had been given previously for night-sweats, was resorted to in large doses, also in combination with arsenic; and, finally, iodide of potassium in 5-grain doses in a bark and iron mixture, a mercurial plaster being applied over the enlarged organ. Under this last combination a slight diminution in the size of the spleen took place.

Early in July a new symptom set in; he began to experience dizziness, which lasted until he took to his bed. He walked with his legs apart, and with a groping gait, and had to use a cane to steady himself. When sitting down, and with everything quiet about him, this feeling entirely disappeared; but if objects about him were in motion, as when riding in a horse-car, he "felt as if everything was turning upside down."

He continued about until October, feeling fairly comfortable, somewhat asthenic, not much emaciated, and without marked cachectic appearance. There was a tendency to diarrhœa, especially after an acute attack of that disease in July. Dyspnœa was not noted. At the end of October he was taken with a profuse diarrhœa. He kept about for a week, and was then obliged to take to his bed, bronchitis and congestion of the lower portion of both lungs also coming on. No ordinary means served to check the diarrhœa, which averaged eight or ten semifluid stools per diem; and when the number of passages was diminished, he invariably felt worse. His pulmonary symptoms soon became urgent. Dyspnœa grew marked; auscultation showed congestion, and probably œdema of both lower lobes of the lungs. These urgent symptoms were relieved by direct treatment in a measure. He was put upon the use of cod-liver oil, which he assimilated readily. Quinia and strychnia, with a bitter tonic, were also given. Iron, which was repeatedly tried, he could not bear. His symptoms all gradually improved, and toward the end of November the most remarkable fact connected with this case became apparent—the spleen began to rapidly diminish in size. Its edge, which reached a little beyond the median line at the umbilicus, receded till it was four inches to the left. It stopped at this point, and grew no smaller; neither did it again increase materially at any time, the edge being occasionally about half an inch nearer the median line; but care was necessary to put him in a uniform position, as the mass was movable, and could be lifted considerably to the right. The lower edge also came up out of the pelvis gradually and steadily. This diminution I am disposed to attribute mainly to the watery diarrhœa; perhaps in a measure also to the cod-liver oil, which was given not only as a nutrient, but with a view also to the property that has been ascribed to it of increasing the number of the red blood-globules. His general condition gradually improved from the low state he was in during November, and he gained in strength so as to be able to sit up most of the day. His tongue was lightly coated, but was over-moist, almost dripping—or, if I should invent a suggestive term for this condition, which is not uncommonly met with, and which I have learned indicates a state of very poor physical reaction—I would call it a "dog's tongue." It is seen in the

latter stages of organic diseases, and in some prolonged malarial fevers. The pulse was uniformly between 80 and 90; respiration 24.

After two attacks of venous thrombosis in December, he rallied very well, and made steady improvement in every respect, even as regards the size of the spleen, until the middle of January. But it is not my fortune to place on record the first case of recovery from leucocythæmia. He was taken, January 17, with chill and pain in the right side, with dyspnœa; and I found the pleura half filled with serum. This increased rapidly; orthopnœa and sleeplessness exhausted him completely, and he died ten days after the onset of the pleuritic attack.

An *autopsy* was made the day following his death. The right pleura was found filled with serum; lung flattened and collapsed. There were shreds of fresh lymph on the pleura. The pericardium was adherent to the heart. The right side of the heart was filled with clotted blood, which may be described as of a raspberry-chocolate colour. The veins and venous cavities throughout the body showed this same curiously tinged, clotted blood, excepting some small veins which were filled with casts of a white colour, and very firm, a knot of them having quite the appearance of a bunch of worms. The heart was enlarged; the mitral valves were thickened; the aortic valves atheromatous, with points of calcification—spots of the same being also found on the aorta.

The spleen was adherent to the liver and other surrounding organs. Its capsule was thickened. It weighed about six pounds, and measured in its long diameter ten inches; transversely, seven and a half inches; and the thickness was five inches. As already mentioned, it had been much larger than this, but even such a magnitude is greater than occasionally reported. The notch was preserved; its tissue was hard and firm. Alcohol failed to preserve it, so unfortunately no microscopical examination was made.

The liver was also much enlarged, being eleven inches long, ten inches wide, and five and a half inches thick. It was apparently fatty.

The kidneys were large and white, having a thin cortical portion and a congested appearance of the pyramids, although the urine on examination during life was normal, except that it contained constantly the usual large amount of amorphous urates. There was no enlargement of any of the lymphatic glands.

The blood, about which the diagnosis of this case turns, was examined several times before death by myself and others. All specimens contained large colourless corpuscles in very greatly increased numbers. Dr. E. R. Hun said that, in a specimen which he examined, there were fields in which hardly a red globule could be seen. I am indebted to him for sending a specimen of the post-mortem blood to Dr. Jos. G. Richardson, of Philadelphia, who examined it with interest, and has very kindly reported to me the results of his investigations. He writes:—

"The specimen of blood from your case sent me by my friend, Dr. E. R. Hun, is very markedly leucocythæmic, the estimated proportion of white to red corpuscles being as 1 to 2, instead of 1 to 335 (the ratio given by Welcker in Stricker's Handbook). The method of enumeration I adopted was a plan of my own, although, I dare say, it may have previously occurred to other observers, viz., simply to spread out the blood in very thin layers upon a slide and allow it to dry; then, selecting suitable fields which were not too crowded, put on the cobweb micrometer eye-piece, and, adjusting the threads so as to cut off convenient spaces, count the red disks and white corpuscles respectively

in each. By this plan any error from motion of the corpuscles is, of course, obviated.

"It may be worthy of note that the white globules in this specimen were unusually large, ten in a group which were measured averaging $\frac{1}{2100}$ of an inch, and one attaining the enormous magnitude of $\frac{1}{1166}$ of an inch. This peculiarity as to size of these corpuscles has been observed to sometimes occur by Professor E. Wagner, who mentions it in his *Manual of General Pathology*, page 546, American translation. Of course, this immense enlargement may not have existed during life, and been merely connected with some post-mortem change in the *liquor sanguinis*, although my impression is that such was not the case."

In connection with this last statement, Dr. Richardson refers to an experiment, detailed on page 5 of his lecture on the Nature of the Salivary Globules and their Identity with the White Blood Corpuscles, which showed that, by diluting the serum of the blood by the aid of a filament of thread passing from a reservoir of fresh water to the covering glass under the microscope, a white corpuscle was seen to "gradually expand, displaying its delicate wall, with two rounded nuclei; then, after acquiring the magnitude of $\frac{1}{1700}$ of an inch, it exhibited the rapid and incessant movement of its contained molecules; and finally, when its diameter reached about $\frac{1}{1400}$ of an inch, it burst suddenly, discharging a portion of its contents."

In the specimens which I examined, taken during life, the proportion of white to red corpuscles was apparently much greater than that found by Dr. Richardson in the partly coagulated post-mortem blood, although no systematic counting was attempted.

I will do no more than conclude the simple detail of this case with a brief allusion to its more salient peculiarities. A very instructive analysis of a number of cases, by Dr. Edward G. Janeway, has not long since appeared in certain issues of the *New York Medical Record;* and I offer this as a contribution to the fund of cases from which such general facts are drawn.

A slight diminution in the size of the spleen followed the exhibition of iodide of potassium, but there was no history of syphilis.

Giddiness was a symptom peculiar to this patient, for I find no allusion to it by any author. It was very marked and persistent, not merely the result of anæmia, but evidently due to disturbance of brain function.

The rapid and very considerable diminution in size of the spleen is a noteworthy fact in this case. Occurring after very free diarrhœa suggests the idea that it was brought about in a measure thereby, especially as checking this was invariably followed by unpleasant symptoms.

Observation of this disease does not appear to have thrown much light upon the physiology of the spleen. The great objection to the theories both of Virchow and Bennett, that destruction of red blood disks or the manufacture of white ones in excess results from hypertrophy of this organ, exists in the fact that hypertrophy very frequently takes place without corresponding blood change. Spleenotomy, moreover, is done

with impunity to dogs; and more or less complete removal of the spleen has been performed in man with success, M. Péan, in 1867, having removed the entire organ without ill result in a supposed case of ovarian tumour, which proved to be a large cyst of the spleen. These facts show that we have no definite knowledge of any important function of the spleen, and that we have no satisfactory data thus far whereby to determine the essential nature of a malady which, when of the splenic form, appears at first thought to be a functional disease of this organ.

ART. XI.—*A Case of Dislocation of both Hips.* By J. B. CRAWFORD, M.D., of Wilkesbarre, Pa. (With a wood-cut.)

ON July 13, 1876, I was called, by a physician of this city, to see Thomas Jones, a large and powerful man, aged about thirty years, who had been injured four or five hours previously while working in a coal mine, by a mass of rock from the roof of the mine falling upon him.

Upon examination, we found a dislocation of both hips; the head of the right femur resting upon the dorsum of the ilium, the leg flexed upon the thigh, the knee lying upon the lower portion of the opposite femur, and the toes turned strongly inwards.

The head of the left femur was displaced in a somewhat different manner, the head being in the ischiatic notch. The limb was nearly straight, the thigh being but slightly flexed upon the body, the knee nearly unbent, and the toes inverted. The accompanying sketch shows a pretty correct representation of the appearances presented. There was inability to move either limb. The lower portion of the spine was strongly arched. The amount of shortening of either limb could not be ascertained, as measurement was not available. The amount of deformity of either hip was less conspicuous than is usual in single dislocations of the same kind.

The patient was thoroughly anesthetized, and the reduction effected by manipulation. First flexing the left leg upon the thigh and the thigh upon the pelvis, I pressed the thigh obliquely across the abdomen, at the same time rotating the femur, using the leg as a lever, and then carrying the knee across to the left side, lifted the thigh to a right angle with the body, and made moderate vertical traction. I felt a sudden releasing of

the head of the bone, and easily drew the limb down to its natural position. After dislodging the head of the bone from the ischiatic notch, it glided so readily and so noislessly into its proper place, that I was a little surprised to find that I had effected its reduction. There was almost entire absence of the "*thud*," with which the dislocated femur usually returns to the acetabulum. Considerable force, accompanied by rotation of the femur, was required to carry the flexed thigh across from the right to the left side of the abdomen; all the other movements were effected with comparative ease. Not more than two minutes were occupied in the process of reduction. The reduction of the remaining luxation was now proceeded with, and was attended with more difficulty than the first. Adopting the method usually recommended, I first moved the limb in the line of its easiest motion; flexing the leg upon the thigh, and the thigh upon the pelvis, as before, carrying the knee well upward and obliquely across the median line of the body. Then attempting to abduct while rotating the limb, I found the movement in that direction suddenly arrested. Again, pressing the thigh firmly upon and obliquely across the abdomen, and abducting and rotating as before, I succeeded in disengaging the head of the bone and bringing it apparently to the posterior border of the acetabulum; but upon bringing the limb down to a horizontal position, I found that the head of the femur had returned to its former situation upon the dorsum ilii. The previous manipulations, varied somewhat, according to the methods of different authorities, were repeated several times with the same result. Finally, having brought the head of the femur to the posterior border of the acetabulum, and finding it again arrested at the edge of the socket, I directed the pelvis to be held firmly down by two assistants while I made strong upward traction upon the thigh while it was bent at a right angle with the body. After applying my utmost strength in this direction for perhaps a quarter of a minute, I felt a sudden yielding of the resistance, and the dislocated bone returned to its socket with a sound that was heard distinctly by all who were present. But little subsequent treatment was required. The patient was taken to the Wilkesbarre City Hospital, ordered to be kept quiet, and a soothing lotion applied over the injured parts. Very little subsequent pain was complained of. He left his bed on the 23d of July, ten days after the reception of his injury, and walked about the ward with but slight difficulty.

Luxation of the hip is by no means a rare accident among those engaged in the mining of coal, as every surgeon, who has practised long in the anthracite coal fields, can attest. The frequent and sudden dislodgement of large and heavy masses of rock forming the roof of the mines, and the powerful machinery required in the preparation and transportation of coal furnish the immense forces which are requisite to the production of this injury. But frequent as single dislocations of this joint have been in this vicinity, I am not aware that any case of double luxation of the hip has occurred in this region, save the one here described, except as it has occurred in connection with other injuries of a fatal character. Indeed, I believe the records of surgery furnish but a very few examples of a similar kind. Dr. Gross in his System of Surgery says, the accident is exceedingly uncommon, and mentions but three instances of its occurrence: one recorded by Professor Gibson, one by Wm. Cooper, of London, and one

which occurred in the practice of Dr. Boisnot, of Philadelphia. Hamilton, in his work on Fractures and Dislocations, mentions only a single example of this injury, that of Professor Gibson. Each of these cases, where the particulars are given, differed from each other, as well as from the one here recorded in regard to the character of the dislocation; in one the displacement being iliac and thyroid, in the other iliac and pubic, while the one here recorded was iliac and ischiatic.

The exceedingly small number of cases in which both hips have been dislocated, would seem to indicate that the conditions which render such an occurrence possible are very rare and peculiar. I have, therefore, taken some pains to learn from the subject of this report what the circumstances were which attended his injury. He states that he was at work, standing on a surface which inclined at an angle of about forty degrees, with the feet widely separated, the right one being much lower than the left, and the body bent forward. While in this position a large mass of rock, weighing many hundred pounds, fell from the roof, several feet above him, striking him in the lower dorsal region, bending the thighs upon the body and pressing him forcibly down upon the rock on which he was standing. He is certain that both joints were dislocated at the same instant, as the falling rock immediately rolled or slid from and released him. Severe bruises upon his back, and a deep cut on the right arm were the only other injuries received.

WILKESBARRE, July 28, 1876.

ART. XII.—*Details of a Case, in which Death is supposed to have resulted from Ether used as an Anæsthetic; with a Brief Account of all the Fatal Results which have been ascribed to the use of Anæsthetics at the Pennsylvania Hospital; with Remarks.* By THOMAS G. MORTON, M.D., Surgeon to the Pennsylvania Hospital.

DAVID D. P., aged 19, single, a telegraphic operator, consulted me in May, 1876, in regard to his right limb, which was quite useless from general atrophy, and an angular partial anchylosis of the knee, evidently a result of old scrofulous inflammation. I advised division of the flexor hamstring tendons, which were very much contracted, and immediate straightening of the limb, and directed an appropriate brace to be made, with a high heel and sole to the shoe for after use. On the 2d of June the patient was admitted into the hospital, when the following notes were made by Dr. W. B. Hopkins, the resident in charge: "Until the patient was two years old, when he began to walk, he had been considered a perfectly healthy child; soon after this a posterior spinal curvature developed; when four years old, inflammation of the knee set in, with subsequent contraction of the flexor thigh muscles, with general arrest of development in the limb, and subsequent partial anchylosis of the knee-joint; the angle

of deformity being slightly obtuse, there had been, apparently, no suppuration of the joint, at least to the extent of an abscess."

"The spinal and limb troubles combined prevented the patient from walking until he was six years old, when, with crutches, he began to get about; there is no history of winter cough or previous chest trouble, and his general health, although not being vigorous, seems not to have been markedly impaired, and no evidence of any hereditary disease can be traced out. The patient is rather pale, but his appetite is good, and he expresses himself as in excellent health; there is marked posterior curvature, which has produced the usual deformity, with great sternal prominence. The right limb is much atrophied and shortened, and presents angular deformity, with a partial luxation backward of the tibia, the anchylosis not being complete. June 3, after a consultation with Drs. Hewson and Hunt, the tendons were divided, and the limb was straightened, and the apparatus, made especially for the case, was adjusted by Mr. Kolbé."

The etherization was conducted by Dr. Wharton, one of the resident physicians; at the close of the operation I saw that the patient was pale, somewhat depressed, but as comfortable apparently as we generally observe after the use of an anæsthetic. The patient was left in charge of Dr. Hopkins, whose subsequent notes are as follows: "At 12.30 P. M., patient, having been removed 15 minutes ago to his room, was seized with symptoms of asphyxia; pulse moderately full, 160; respirations nearly ceased; general cyanotic condition more marked in the face and tips of of the fingers; his tongue was at once depressed, cold water dashed on his chest, which produced only violent respiratory efforts. At 1 P. M. condition remains much about the same, and there being evidences of pulmonary engorgement, with frothy blood-stained mucus, constantly collecting in the throat, while the heart's action was active and laboured, the radial artery was opened, and about 8 oz. of blood were drawn; dry cups were applied to the chest; for a time the respiration seemed slightly improved; the volume of the pulse increased somewhat, and fell from 160 to 152 per minute. At 1.45 rapidly sinking; hypodermics of whiskey and carbonate of ammonia were used without avail." Dr. H. sent me the following note: "P. died at 2 P. M.; about ten minutes after the operation he was removed to his room, being perfectly conscious, and I having seen to it that he had perfectly recovered from the ether, he suddenly became asphyxiated; the ordinary remedies proved of no avail."

Dr. Morris Longstreth, the hospital pathologist, made the *post-mortem* 21 hours after death. "The rigor mortis was well marked; there was considerable deformity of the chest; the lumbar portion of the spinal column was at its lower part bowed backwards, so that the last two vertebræ were nearly in a right line with the upper portion of the sacrum, thereby making the cavity of the pelvis very capacious. The abdominal viscera were normal, although somewhat out of position. Thorax—the pleural cavities contained a considerable amount of serum, included in the meshes of an abundant firm net-work of inflammatory adhesions (old). The serum contained no recent lymph, and it was impossible to determine its quantity, on account of the very great amount of similar serum pressed out from the lungs in the process of their removal; the lower part of the right pleural cavity was, to a considerable extent, obliterated by very firm adhesions existing between the diaphragm and the costal pleura. The amount of serum was not very great at any one portion of the pleural sac, but rather diffusely infiltrating the adhesions present. Both lungs were

moderately well crepitant throughout, pitted deeply on pressure everywhere; on section, serum frothy and a little bloody exuded with great freedom and in large amount, as though from a saturated sponge; their cut surface was grayish, showing some blood points; there was no solidification or even deep congestion of their tissues. Divided portions as well as the whole floated well in water, and there was no evidence of plugging of their vessels, and the blood in them was entirely fluid. Pericardium contained a considerable amount of clear, very pale serum; the heart was only moderately in a state of muscular contraction, a slight amount of fat covered its surface along the grooves; the blood within the cavities was quite fluid; the muscular tissue, the valves, and the large vessels were all normal. There was no foreign substance of solid nature discovered in the larger bronchi or in the trachea. The other parts of the body were not examined."

The unfortunate result in this case, apparently caused by ether, naturally produced, not only upon myself, but upon those who had a knowledge of it, a profound impression, as it was seemingly a proper one for the use of the anæsthetic. Ether or "washed ether" as an anæsthetic agent has been uniformly looked upon as perfectly safe; personally, I have administered it on all occasions, at all periods of life, from infancy to extreme old age, with the feeble as well as in the strong. In giving ether I have never used any "inhaler," so called, but have invariably made use of a napkin or coarse towel, on which the ether is poured, when the cloth is then simply folded in a conical shape, and held over the patient's mouth and nose; so soon as the napkin becomes the least soiled or "ether-logged," a fresh one is substituted. Dr. Wharton, the resident who gave the ether in this case, says: "I am satisfied that not over two and a half or three ounces were administered in P.'s case; he seemed to be readily affected, and was not under its influence over twenty minutes. There was no vomiting, and the respirations were not laboured; on removal of the napkin he rapidly regained consciousness." Although this patient had a marked spinal curvature, with chest capacity below the average, anæsthesia on this account was not contraindicated, for I have frequently used ether in cases where the deformity of the chest was much more marked without the least difficulty. The autopsy demonstrated that the lungs were seriously restricted in their natural movements by the adhesions which bound them down in all directions, and consequently the secretions which formed were not expelled; at the close of the etherization there was no evidence of any mucous collection, at least when I last saw the patient at 12 M.; fifteen minutes later, when Dr. Hopkins was called, the change was very marked, and it was during this short interval that the serious symptoms were manifested. Mucous secretion, which often rapidly forms, is one of the most annoying symptoms in the course of etherization; in many cases it is not observed at all, but when it occurs to any extent, it is much safer to suspend anæsthesia until the throat is thoroughly cleansed, or the patient is relieved by his own efforts. I have often ob-

served that those patients who have been the most difficult to manage while being etherized, are the easiest to keep anæsthetized after the first excitement of the ether has passed over, and seldom suffer from any mucous secretions. Gross,[1] when on the subject of death from ether, says:—

"How the inhalation of ether proves fatal has not been decided; when death occurs promptly, as during, or very soon after, the administration, the probability is that it is caused by asphyxia, whereas, when it occurs at a later period, as after the lapse of hours or days, there is reason to believe that it is due to the effects of congestion of the brain and lungs, either alone, or in conjunction with gastric irritability, which often exists in a most distressing degree."

In P.'s case death was the result of the mucous secretion and serous effusion which invaded every available space, thus suffocating the patient; there was not the least evidence of any intracranial difficulty; the patient was quite rational to the close.

There is seldom any danger from ether when properly administered, and there is abundant evidence to show that fatal results are less likely to follow its use than any other anæsthetic agent. The fact of ether having uniformly been looked upon as a perfectly safe agent on every occasion may, I am inclined to think, have induced great carelessness in its use; the occasional deaths from, or at all associated with ether, should in the future be sufficient to serve as cautionary signals, a constant watchfulness should be observed by the etherizer, and every symptom carefully noted, especially all complications arising from bronchial secretion, pulse failure, or vomiting, and I am satisfied that not only should the patient be watched by a medical man during anæsthesia, but until reaction has been thoroughly established, and the ether effects entirely passed over; I have seen, as probably all surgeons have, ether poured upon the inhaler or napkin in great excess, so as to flow down on the patient's face and neck; the cloth thus becomes saturated, is not pervious to air, and the patient almost suffocates; such practice cannot but be severely condemned.

The assistant should devote his attention exclusively to the patient, while a few drachms at a time, with care, poured on the napkin will generally induce anæsthesia promptly; when the napkin becomes the least soiled, another should be substituted, and when complete anæsthesia has been induced, occasional inspirations of pure air should be allowed. Ether has been most successfully employed in the Pennsylvania Hospital for more than twenty-five years; it was introduced about 1850, and first used in a case of luxation of the femur, which resisted repeated attemps at reduction with the pulleys; it is needless to say that after etherization no difficulty was experienced, and from that time to the present this agent has been in daily use, and with the few exceptions herein noted has been the only anæsthetic employed.

[1] Surgery, vol. i. 569, 5th ed.

Ten years or so ago, a mixture of ether and chloroform was occasionally used, but a fatal result which occurred, led to its final abandonment.

The subject referred to was a German, aged 35, who was admitted with severe railroad injury of the ankle. I performed an amputation of the leg, using ether as the anæsthetic; a rapid recovery followed; some necrosis of the tibia developed, and my colleague, Dr. Hewson, into whose care the case had passed, thought best to remove the dead bone; and accordingly on May 4th, 1865, the operation was undertaken. The late Dr. Ed. Rhoades, then the resident, in his report of the case, stated, "that the patient died in convulsions during the administration of an anæsthetic for the removal of necrosed portion of tibia; convulsions occurred before anæsthesia was produced; the mixture used was chloroform, two parts; ether, three parts; alcohol, one part." This patient had been a robust man, took ether at the time of amputation well, so that the unfortunate result cannot be laid at the door of the agent ether, but rather to that of the chloroform. I believe no post-mortem was allowed.

The second fatal case occurred about 1867; a feeble old man was admitted, with a strangulated hernia of some days' duration, into Dr. Hewson's ward; the patient was a hard drinker, he had suffered much from exposure and insufficient food; after etherization, it was found impossible to return the gut, and herniotomy was decided upon, the anæsthesia having already been kept up a considerable time; Drs. Hunt and Agnew were also present; the patient took ether badly, and soon after the operation was commenced, a copious bronchial secretion kept filling the patient's mouth, and during an effort to expel this a very large portion of the bowel was forced out; at this time the breathing became labored, and the pulse faltered, the mucus which collected could not be expelled, and asphyxia developed rapidly; the galvanic current and other remedial agents were vigorously tried, but the patient expired on the operating table. In this case the great feebleness of the patient, his previous bad habit, alcoholism in fact, associated with the depressing effects of the strangulated bowel, would have been almost sufficient to have induced a fatal result, had the operation been performed without ether; yet, the ether was unquestionably the immediate cause of death.

The only other fatal result associated with ether that I know of as having occurred in the Hospital was in the early fall of 1872; the subject was a man of 35 years of age, he came from the far west for amputation, was in the care of my colleague, Dr. Levis; a gunshot wound of the thigh had involved the femur, producing a comminuted fracture; consolidation, however, took place, but considerable necrosed bone remained, and abscesses with numerous fistulous sinuses formed, through which immense quantities of pus escaped; at last it became a question of life or limb. Just before the etherization, which was commenced in the ward, 20 grains of chloral were given, and when the anæsthesia was completed, the patient was carried into the amphitheatre, after having lain some little time in the hall leading to the clinic room, etherization being fully kept up; just as the operator was prepared to commence the amputation, collapse occurred and death followed at once; no examination, I believe, was permitted.

My friend, Dr. Hunt, some time ago[1] asked the question, "are the kidneys active eliminators of ether?" and at the same time reported the case

[1] Phila. Med. Times, Feb. 6, 1875.

of a young man brought into his wards with a crush which required amputation of the forearm; after a few inhalations of ether the pulse failed, and the patient seemed sinking; the etherization was suspended, and restoratives were applied, and the patient slowly reacted. In the afternoon another attempt was made to etherize, and after a few whiffs, a repetition of the morning's experience was threatened; the operation was performed without the ether; for a few days the patient did well, then rapidly grew worse, became feverish and delirious; the stump ceased to heal, surgical fever was diagnosed, but pyæmia was not marked. Death occurred two weeks after the injury, and the post-mortem showed the kidneys to be in a marked stage of fatty degeneration, which materially interfered with their eliminating power. No examination of the urine had been made, for there were no symptoms which seemed to call for such an investigation. Dr. H. remarks, "May not conditions of this kind often explain the unpleasant and even fatal action of an anæsthetic? The practical lesson is obvious: before a serious operation, should there be the slightest reason to suspect hidden trouble, examine the organs and secretions and be on guard." I counsel even more than this, that, before any operation or etherization, the urine may profitably be examined. Although I have never known ether to act in the manner noticed by Dr. Hunt, yet I can readily understand that with a uræmic condition, the additional ether-intoxication, the heart's failure may readily be accounted for. In quite a number of instances, however, when I have been compelled to use ether, at the same time well aware of an albuminous condition of the urine, no bad results were experienced. In a case lately of tumour of the breast, which was sent to me for operation, in a subject otherwise apparently robust, I declined to remove the growth after an examination of the urine, which showed a large amount of sugar.

In 1866 I used the nitrous oxide gas quite frequently in the hospital, not only in operations which were rapidly performed, but in a large number of major operations, including several thigh and leg amputations; in some respects the gas acted satisfactorily, but the intense venous congestion, and death-like appearance of the patient, and rapid pulse, which always occurred when anæsthesia was kept up for some minutes, made me very anxious.

Dr. J. D. Thomas, of this city, who has had a vast experience in the administration of gas for the extraction of teeth, having given it in more than sixty thousand cases, tells me that he has never had any bad results from its use. In minor operations, which can be rapidly performed, a small amount of gas is all-sufficient, and since there are no unpleasant after-effects, as we have sometimes from ether, it is on this account often a more satisfactory agent. The great drawback to the more general introduction of the gas is from the difficulty in carrying it about, while a long experience in its use has demonstrated that it is a dangerous agent when its

effects are continued for any length of time. Ether, on the contrary, may be used with impunity, for patients may be kept under its influence for hours, or even days, without danger. Some years ago my friend, Dr. E. Wilson, was called to a case of convulsions, after a forced labour at seven months. The patient had just completed the sixty-fourth convulsion. Dr. W. at once sent for ether; before it came another convulsion had passed over. He at once used this anæsthetic, and kept his patient under its influence uninterruptedly for four days and nights, using, during that period, more than *two gallons of ether*. His patient had no further convulsions, and finally recovered.

In order that I might know the kind of ether used at the hospital, I directed Mr. C. Wirgman, our apothecary, to address the well known chemists, Messrs. Powers & Weightman, on the subject, who replied as follows, under date of August 2, 1876:—

"Your letter asking for information in regard to the purity of the 'washed ether' which we supply the Pennsylvania Hospital has been received. In reply, we would say that we believe our article to be pure, the usually recognized tests confirming us in this belief. In making our ether we follow the process published in the U. S. P., and wash with water as a preparatory step to making the 'stronger ether,' the specific gravity, according to our own and other weighings, will vary from .7299 to .7324 at 60° Fahr., and never finish off less than ten gallons at a time. While we regret exceedingly the sad result in the case mentioned in yours, we cannot think the anæsthetic the cause, but rather due to some idiosyncrasy of the patient, having had no complaint from others supplied with the ether made at the time and from the same lot as that sent you."

The histories of the cases which have been given, comprise all the unfortunate examples which are known to have occurred in the hospital; even these unfavourable results do not lessen in the least my entire confidence in ether as a safe agent, but with this, as well as with all anæsthetics, the details of the cases reported offer a caution, that in every instance the greatest care should be exercised, guarding against all and every source of danger which may probably arise. Thus the very slight mortality ascribed to or in any wise associated with ether may yet be lessened or entirely averted.

ART. XIII.—*Report of a Case of Fracture of the First, Second, Fifth, and Sixth Cervical Vertebræ, with Recovery and Autopsy.* By C. S. MAY, M.D., Second Assistant Physician, Connecticut Hospital for the Insane, Middletown, Connecticut.

THE following report of a case of fracture of the cervical vertebra at two points, with extreme compression of the spinal cord in the atlo-axial region, I offer to the profession because of the remarkable prolongation of life, with good physical health, and restoration of most of the neurotic

functions of the medulla spinalis, and because I can find no reported case of recovery after so severe lesions in the spinal column.

George H., aged 56, a native of Connecticut, was admitted to the Connecticut Hospital for the Insane August 30th, 1872. "Stout build, and general health good." This was the third attack of mania, the first occurring when he was forty-two years of age, at which time he was in an asylum for four months. I can find no account of the second attack. The present seizure has lasted for several months, and for the past few days he has been so violent that he has been confined in a jail.

I can ascertain nothing of his hereditary tendencies, excepting that his family is long-lived, of vigorous health and active habits. His habits have been those of a wanderer, having been a sailor, Californian pioneer, steamboat engineer, etc. In June of this year (1872), he was, and for some time had been, at work in a lumber yard, quite sane, and doing the work of a common labourer. As he had lost a small steamer which he had owned, through having endorsed for others, he was at times unsocial, and depressed in spirits, but there were no other signs of mental disease, having recovered from his second attack of insanity several years before. While upon a pile of lumber, he stepped backwards upon a projecting board, and fell, probably not more than fifteen feet, striking upon the back of his head. When taken up he was unconscious, and, according to the statement of a relative who nursed him, he remained in this state the most of the time for a week. After that he was unable to feed himself for some time, although, as his nurse now remembers, he could move both upper and lower extremities a little. I could procure no account of the sensorial conditions, but the motor functions gradually improved from this time, so that in a little less than two months, he was able to crawl out upon a veranda of his house, and was found there one morning when his family arose. The treatment up to this time had been good nursing, and position, with blisters upon the nucha, tinct. iodinii, etc., during convalescence. He gained strength rapidly, but carried his neck stiffly. Shortly after getting out of doors he began to use bad language to strangers, to get in front of railway engines, and wander about at night. When admitted to the hospital, his neck was stiff and straight, without a semblance of grace, and its muscles stood out beyond the occiput from that bone to the shoulders, all of those in the posterior region being hardened, thickened, and appeared, when manipulated, like cartilage. He could nod the head slightly, but was unable to perform the rotary movements.

Below I give portions of the main history, as noted in the hospital case book, that his active habits may be understood, as well as to account for post-mortem revelations.

September 15. Two weeks after admission. Is somewhat noisy and mischievous. Requires large doses of chloral hyd. at night to keep him quiet and induce sleep.

October 15. Has been out to work upon the farm for a few days, and is somewhat improved. Eloped from those who had him in charge.

November 15. Returned from elopement. He went to his home, a distance of at least fifty miles, and he says that he walked all of the way. From this time, until his death, the account shows him to have been rude, noisy, filthy, discontented, and troublesome at all times. In April, 1875, he began to dribble urine, and upon examination with a sound I could detect a vesical calculus. And as for a year he had been disposed to crowd trash into his urethra, having removed from it at different times a suspen-

der button, which lay an inch from the meatus; and at another a vest-buckle of brass, rolled up with its points projecting; I could believe him when he told me that in the previous autumn, he pushed a rye straw taken from his bed into his urethra, where a piece of it was broken off and retained.

1875, *September* 28. Died from suffocation.

A large piece of muscular and tendinous structure was found wedged in the larynx, with the epiglottis raised. He was taking his supper of a coarse soup or stew, when he suddenly sprang from his seat, flung up both hands and fell, apparently dead. I saw him in less than five minutes. He breathed twice faintly. Had no pulse at the wrist, and being unable to resuscitate him, as a last resort I made an opening into the trachea, but could not induce a heart beat or respiration by any effort.

Autopsy eighteen hours after death.—Rigor mortis marked; body well nourished. The epiglottis was raised, and lodged firmly in the larynx was a large piece of beef, plugging the orifice of the rima glottidis. There were slight pleuritic adhesions in the anterior part of the upper lobe of the right lung. With this exception, the pulmonary organs were healthy and well developed.

The heart showed nothing abnormal, save a slight amount of atheromatous deposit in the walls of the aorta, just above its valves.

Abdomen. The stomach, liver, gall-bladder, spleen, intestines, etc., healthy. Both kidneys were of the large white variety, filled with mottled spots, and with the cortical substance thinned. The right kidney had a double pelvis, with two ureters, the latter passing to the bladder normally, one of them terminating at the proper point in the bladder, and the other about a half an inch above and anteriorly to the first one, both orifices presenting the same general appearance. The pelves of this kidney were dilated, and their walls were thinned. The bladder contained a phosphatic calculus shaped like a pear, which had formed around a piece of rye straw, pushed into the bladder not far from a year ago. It measured one and a half inches in the long diameter, and one and three-sixteenths inches in breadth, section showing the straw in its centre. The mucous membrane of the bladder was thickened, and about its base and neck where the stone had rested were phosphatic deposits, giving the membrane a rough, grater-like appearance. There was chronic inflammation and congestion of the membranous portion of the urethra, with dilatation of this portion of the canal. The rest of the urethra presented a healthy appearance, as did also the testes and prostate.

Head. Calvarium normal; dura separated readily. The Pacchionian bodies were normal, but between the external and internal layers of the dura, adherent to the external layer, on the right of the falx, and just posterior to the anterior fontanelle, was a small thin plate of bone, about an inch long, and three-eighths of an inch wide at its broadest end. This was perforated by canaliculi, like a section of one of the long bones, and was rough upon its lower face, and smooth upon the upper. The weight of the brain was fifty ounces, and there was no abnormality in its vessels, membranes, or structures, that could be discerned by the naked eye. Its ventricles were natural, but the choroid plexus was tortuous, and at least twice the normal size.

After removing the brain, the superior part of the sphenoid bone attracted my attention, and I found that it was loosened from the main bone, being attached to it only through the interposition of cartilage

easily cut with the scalpel. The specimen preserved and thus attached consists of the remains of the entire superior surface of the bone, and comprises that part which usually makes up the optic groove, olivary process, sella turcica, and middle and posterior clinoid processes. The uppermost portion of this detached piece is dense, and like new osseous formation, being divided longitudinally into two parts about equal in size, which are connected by cartilage. The small portion of bone underneath these is darker in colour and more spongy, like the natural body of the sphenoid bone.

As at this time I knew nothing of the patient's having had a fall, with injury to his neck, excepting an incoherent story told by himself, I did not care for the spinal cord, and I carried my bistoury down into the vertebral foramen to sever the cord below the medulla oblongata, and cutting as usual I discovered an unnatural constriction of the canal, which proved to be a flattening from before backwards. The foramen magnum was of normal size and shape, and I completed the section of the cord, now too much torn and haggled to be of value for examination. The cervical vertebra being removed, the axis was shown to have been subjected to severe fracture and dislocation, having been driven upwards and forwards, and the body of the bone tilted upwards and backwards, nearly obliterating the vertebral foramen of the atlas. Its body was also twisted to the right, and fully two-thirds of it lay to the right of the centre of the tubercle of the atlas, lying partly in and partly below the vertebral foramen of the latter, filling the foramen, so that, cleaned from soft tissues, it measures but one-fourth of an inch in the antero-posterior diameter at its widest point, and tapers from this in a crescentic form to two points, the distance between which is one and one-sixteenth inches, this making the lateral diameter, but it is so much narrowed on the left half of the crescent, as to have left no room for the cord at this point, being but one-eighth of an inch wide at the widest part of this half, diminishing from that to a point. The transverse processes of the atlas and axis are uninjured. About three-eighths of an inch of the right lamina of the atlas in the groove for the vertebral artery and first cervical nerve has been absorbed, leaving a gap of that length, which is partially filled by the right superior articulating surface of the axis. The axis is so twisted that its left superior articulating surface joins and had grown to the anterior half of the left inferior articulating surface of the atlas, and partial absorption of this part of the axis had taken place. The spinal foramen in the left transverse process of the axis is but half the size of that in the right; this being caused by the encroachment upon the canal of the callus which connects the articulating surfaces just above. The articular surface of the atlas at this point was partly absorbed. The odontoid process was broken off at its neck, and had grown by bands of new bone to the middle of the superior part of the body of the axis, and very firmly in the same manner to the whole of the posterior and superior surface of the anterior arch of the atlas. The axis had suffered more injury than the atlas, the only change in the latter being the fracture and absorption of its right lamina, noted above. The axis, however, has its entire character changed. The union between the two bones is very close, and the new formations, like all callus, are whiter and of firmer texture than the natural structure near it.

The articulation of the atlas with the occipital condyles was natural.

The third and fourth vertebræ were entire, and all of their articulations

normal, but the fifth and sixth cervical vertebræ are firmly united at all of their articulating surfaces, as were also nearly the whole of their left laminæ; the bones appearing to have been firmly driven together, their anchylosis being complete, and their bodies thinner than usual.

There was no evidence of fracture about the bodies of these bones, but their union is firm, and their transverse processes seem to have been broken or comminuted, those on the left side sustaining most injury.

There are to be found recorded less than a half dozen cases of fracture of the atlas or axis, or both, with recovery or prolongation of life for any length of time. And so far as my researches extend I can find none in which the structural changes in the bone were so great, or the cord so much constricted, as in this.

In *Holmes's System of Surgery*, vol. ii. p. 396, Dr. Phillips has reported a case in which the atlas, through indirect violence, had been driven down upon the axis, but the vertebral canal had not been encroached upon in any great degree.

Dr. Ashhurst speaks of cases which have been recorded by "Cline, Willard Parker, W. Bayard of Canada, Stephen Smith, and several other surgeons," although giving no detailed description of them.

In the case reported by Cline, a child of three years lived for a year after the accident, which consisted of a fracture of the atlas in such a manner that "the odontoid process of the axis had lost its support, and was constantly liable to fall back upon the spinal marrow."

In the well-known case described by Prof. Willard Parker, quoted in *Gross's System of Surgery*, vol. ii. p. 171, and in *Hamilton on Fractures*, p. 157, it may be found that the patient survived the accident for five months, at the end of which time he suddenly expired, from the odontoid process becoming displaced during some inadvertent movement of the head; this process having been completely broken off at the time of the accident, and its lower extremity turned backward towards the spinal cord, a result favoured by the destruction of the occipito-axoid ligament, which was the only ligament injured.

Of the cases reported by Drs. Bayard and Stephen Smith I have no details. Prof. Hamilton, however, has reported two cases of fracture of both atlas and axis, one of which died instantly, and the other survived for five days. In neither case was there sufficient displacement to produce pressure upon the spinal cord.

In spinal curvature we often meet conditions that have produced stretching of ligaments within and about the vertebral canal, shortening of the column, and changes in the course of, as well as pressure upon the cord; but these are wrought so slowly as to be compatible with life and a fair degree of activity. It has been said that dislocation and deformity are comparatively frequent, but that these as a result of injury are rare; and again that the transverse and restraining ligaments will undergo extensive stretching of their fibres without being ruptured.

And of the cord, Dr. Alex. Shaw, in *Holmes's Surgery*, vol. iv. p. 130, says that "Changes of the most extraordinary magnitude may be effected in the brain and cord by encroachments of various kinds, without the sacrifice of their functions, on condition that the intrusion is made slowly and gradually." But these things have more bearing upon the dorsal and lumbar portions of the cord than upon the cervical, although the same general law must have an influence upon its whole length. In a fracture so grave as this which I have reported, the ligamentous structures must have been torn at once; the changes in the size of the canals in large part instantaneously produced. The cervical medulla and its branches must have been severely compressed at the moment of the accident, and from that time until repair was complete, the nerve structures have been subjected to the influence of the changes and activity of circulation incident to the new bony formations. This case is more interesting, from the fact that bony union had taken place; this being said by Bell never to occur after fracture of the vertebra, but later, by Rokitansky, to be "rarely met with."

Why there should have been the apparent escape from disturbance of the functions of the phrenic nerve must be a question, but I am inclined to think that the compression of the cord at the point of the upper fracture was not accompanied by any change of its structure, either morbid or destructive, and that, as the lower fracture was not attended by any great degree of displacement of the bones, except in the perpendicular, the quiet respiration of a man lying inactive in bed, could be carried on by the muscles supplied with neurotic properties by the "external respiratory nerve of Bell," which arises from the fifth and sixth cervical nerves, and whose terminal points are in the serratus magnus muscle, and that the functions of the principal respiratory nerve (the phrenic) were for the time suspended, until the cord had acquired a tolerance of compression that would allow this important branch to resume by degrees its place as the nerve of active respiration. As a result of the fractures there was a shortening of the spinal column, and the portion of the cord containing the origin of the phrenic was drawn or fell below the natural position, so that the pressure was produced upon a part of it, if possible less vital, which took the same position relative to the bony case, which is normally held by the point of origin of the phrenic nerve. It is probable that the injuries to the fifth and sixth vertebra had no direct influence upon this nerve, being below its origin; and that the root of the nerve was within a section of the cord, bounded above by the fracture and compression, and below by the fracture alone, neither of which produced enough lesion of the structure of the cord to permanently disturb the functions of the nerve. For I believe that all authorities agree that fracture and displacement of the second cervical vertebra is followed by speedy death, excepting in cases in which the displacement, and consequent compression, are very slight.

It would seem almost inexplicable that in this case there should be such serious bony lesions, besides the changes incident to Nature's remarkable effort at repair, and the functions of the cord be so little disturbed, either primarily or secondarily; and that in so many cases of concussion of the spine, where no fracture, compression, or malposition can be found upon post-mortem examination, the effects of the injury should be so serious to the neurotic functions of the offshoots of the cord, and often to the life of the patient; were it not probable that there was no lesion of the cord or its membranes, but that they remained intact though greatly compressed; the hardy constitution of the patient enabling him to withstand the primary effects of the injury; and that during the two months which he lay in bed, the spinal cord acquired a power of accommodation to compression, which power can rarely be expected, anticipated, or promoted. It is unquestionably true that the portion of the cord within the ring of the atlas is the most vital point in the nervous system, and generally it may be said that in cases of injury of the vertebra or cord, the chances of fatal issue vary inversely with the distance of the point of injury from the brain, so that it is at least remarkable that this patient did not die four years ago from fracture of the spine, or, if not from that cause, from the fracture of the sphenoid bone, and the latter, which I believe to be unparalleled, might be reasonably doubted did I not hold the bone as a proof of its having occurred.

ART. XIV.—*Case of Hepatic Abscess.* By OLOF PAGE, M.D., of Valparaiso, Chili.

ON the 27th of June, 1875, a caulker, aged 30, applied for advice in regard to a tumour situated in the left hypochondrium. He gave the following history of himself: He said that he often took wine and spirits to excess, but never enough to cause any interruption in his work. For two or three months previous to his coming to me he said he had been engaged in repairing one of the floating-docks in this harbour, and that whilst thus occupied he very often got wet. In the latter part of April he had a mild attack of dysentery, which readily yielded to simple food and rest in bed for a week. On the 9th of May he left his home, feeling perfectly well, but having during the day indulged freely in liquor, he was on his return home seized with vomiting, pain below the ribs on the right side, and in the right shoulder. He had a chill, and fever afterwards. There was no diarrhœa. After the lapse of eight or ten days he began to have rigours and night-sweats. Seven or eight days later his wife noticed, for the first time, a small tumour to the left of the median line, accompanied, as she said, with pulsation. The tumour continuing to increase, a physician was then consulted, who told them that this proceeded from the liver. He prescribed leeches, to be followed by the application of

a blister. On the 9th of June, a cough, troublesome especially at night, declared itself, accompanied by dark, chocolate-red expectoration. Such is the history given to me, which I have tried to make as clear and short as possible.

I found the patient very thin, and of a pale straw complexion. The conjunctivæ had, I may say, a very slight yellow tinge. The tongue was perfectly clean, the pulse 90, and the temperature 100° F. The heart-sounds were clear, and the chest on both sides in front equally and normally resonant on percussion. On auscultation, no disease could be detected at the apices of the lungs.

Behind and over the lower two-thirds of the right lung there was dulness on percussion, and, on auscultation, diminished respiratory murmur and increased vocal resonance. On deep inspiration fine crepitation could be heard in different parts. Expectoration was pretty copious, and of a reddish-chocolate colour, as above mentioned.

The percussion limits of the anterior face of the right lung were normal. To the left of the mammary line dulness followed a slightly descending course, describing a curve beyond the left costal arches to the extent of two inches.

The right intercostal spaces were not quite so distinctly marked as the left, and measurement gave an inch more on the right than on the left side. No pain was felt when pressure was made on these intercostal spaces.

All pulsation ceased when the patient sat upright. The tumour felt hard, but elastic; smooth, slightly movable, and apparently deep seated. The skin, which was not at all discoloured, seemed perfectly adherent to the tissues beneath. There was an indistinct sensation of deep fluctuation, and pressure caused a great deal of pain.

Along its upper borders the tumour could be traced to within half an inch of the ensiform cartilage, and to within one inch of the right costal arch. Overlapping the median line one inch at the level of the umbilicus, it swept in a curve to within three inches of the left ilium, to follow an upward course along the margin of the left ribs. The percussion note between the tumour and the edge of the right lobe was perfectly clear, whereas the narrow space between the tumour and the left costal arch was not quite so resonant. I may add, that there was no enlargement of the spleen, no œdema, and the urine without albumen.

Diagnosis.—The history which the patient gave of his intemperate habits, the onset and course of the disease, combined with the physical signs, and the very characteristic expectoration, pointed to its having been a case of acute hepatitis running on to suppuration. The physical signs in the lung, and the presence of purulent and bloody expectoration, proved that the pus had made its way through the right lung; and the tumour in the left hypochondrium, that it had likewise made a way for itself through the abdominal walls. The resonance which existed between the tumour and the costal arches could be accounted for on the supposition that the abscess had become encysted.

The question now arose as to whether this pathological condition was due to the formation and existence of one very large abscess, pointing upwards and downwards, or to that of two, one in the posterior part of the right lobe and the other in the left lobe. The rule, I believe, is, that in non-pyæmic cases there is generally but one abscess. It is quite possible, in the present case, that a large abscess occupying the central por-

tion of the liver, should have pointed through the concave surface of that organ, working over to the left hypochondrium; then, that this having become encysted by a process of adhesive inflammation, the pus should have gone in the opposite direction through the lung. And by comparing dates, we find that cough first began some twelve or fourteen days after the appearance of the tumour. Taking the ground that two abscesses had formed in the beginning, we found that there was no enlargement at all of the right lobe, whereas the percussion dulness over the left lobe was very much increased, leading one to the belief that pus might have formed there from the very first. In connection with the different modes in which abscesses of the liver make their way out, I cannot but refer to a most interesting and instructive article on this subject in the *Revutá Médica*, by Dr. A. Murillo, of Santiago. He reports, amongst others, the history of two cases of abscesses in the left lobe, bursting into the pericardium, causing almost instant death. In one of them the autopsy gave the following result: The pericardium greatly distended by a large quantity of sero-purulent liquid; false membrane, nearly a centimetre in thickness, covered the entire surface of the heart, principally the right auricle and ventricle, which were somewhat enlarged. The liver was enormously increased in size; and a large abscess, which had destroyed a great portion of the left lobe, perforated the diaphragm, forming adhesions with it, and extending into the pleural cavity; it occupied a space equal to that of the distended pericardium, opening at the same time into that important serous sac. The same abscess had likewise invaded the anterior and superior wall of the abdominal muscles in the vicinity of the ensiform cartilage. The liquid which it contained was of the consistence of syrup, and of a greenish-yellow colour. The gall-bladder was small, and full of yellow bile. No visible or important alteration in the lungs, stomach, or duodenum. The pancreas, in its upper part, firmly adherent to the liver, principally in the region occupied by the abscess. The peritoneum was in a normal condition.

A remarkable case was communicated to me by my friend Dr. von Dersauer, of a man upon whom he and Dr. Alluede Padin had operated. A large quantity of pus was removed through an aspirator, and then about 150 grammes of tincture of iodine injected. In about half an hour's time the patient was suddenly taken with symptoms of collapse, etc., and vomited a considerable amount of tincture of iodine. An emetic was given to clear his stomach, but not a drop of iodine appeared, nothing but a little clear liquid. I have no doubt that a perforation of the œsophagus must have taken place, and that the emetic must have had the effect, through muscular contraction, of closing the orifice. The lungs were perfectly healthy, and it is, moreover, scarcely to be imagined that such a quantity of iodine should go through the larynx without producing quickly fatal symptoms. The patient made a good recovery.

Treatment.—An operation having been proposed, to which a most willing consent was given, I went on the following day, the 28th of June, to my patient's house, which I found situated in one of the numerous quibradas of this place, which really mean open sewers, into which all sorts of filth are thrown. I must say that owing to the remote quarter of the town in which he lived, and other impediments, I was not able to visit him regularly, nor take proper thermometrical and other observations. Having placed the man in a convenient position, a small trocar was put into the most prominent part of the tumour, and on its withdrawal thick,

reddish-looking pus came up through the canula. Having removed this, a director was introduced, and, convinced that adhesions had taken place, and that the abscess was entirely separated from the liver, I made an incision nearly two inches in length. Enormous quantities of the same matter ran out. I passed a probe into the cavity about four inches, and in a direction to the right. Injections of a weak solution of carbolic acid and warm water were made, and a very large drainage tube left in the wound. A binder was put round the patient's body, and a little stimulant given on account of faintness. He was ordered the best food he could procure for himself, and for medicine quinia and sulphuric acid, and for the harassing cough to take morphia at night.

June 30th. Felt somewhat better, had not coughed so much, but no change in the expectoration. Discharge from the wound the same. Pulse 96. Temp. 100° Fahr.

July 1st. Sitting upon a chair. Discharge not quite so profuse. Expectoration less.

5th. The wound contracted a great deal, the tube could no longer be introduced. Cough and expectoration much less. Patient complained of night sweats. Right lung, no change.

8th. Further diminution in expectoration, still bloody.

30th. The patient walked into my consulting room, declaring that he felt perfectly well. Cough and expectoration had disappeared, and the lung had resumed its functions. The wound entirely closed.

May, 1876. He is at this present time alive, although in poor health, owing chiefly to irregular habits.

It will be seen, in the case under consideration, that the hepatitis was preceded by a mild attack of dysentery, and it is a well-established fact that abscess of the liver is sometimes due to ulceration of the bowels; nevertheless I do not think, from the history which we have given, that we should be warranted in holding such an opinion in regard to our patient. There were in the first place several days of perfect health, and in the second place acute hepatitis came on after a day's hard drinking. But that there can be no doubt as to the frequency of hepatic abscess after dysentery may be learned by referring again to Dr. Murillo's paper. He mentions that Dr. E. Rodriguez, in a report on the causes of dysentery, states that out of 23 fatal cases of this disease there were 11 that had one or more abscesses of the liver, and remarks that this is a frightful proportion, and without doubt exceptional. Dr. S. Litelier made 47 post-mortems of dysentery cases, and found 10 with abscess in the liver. Dr. Murillo attributes the frequency of hepatic affections principally to the effects of climate, and the abuse of liquor, and a certain proportion as due to dysentery. Although the extremes of heat and cold are not so marked as, for example, in the United States, the difference, nevertheless, between the day and night temperature here is far greater. A man who has been drinking all day, and remains exposed to the night air, may be almost sure of getting acute hepatitis. But that dysentery, unless complicated with the habit of drinking to excess, should in so large a percentage be followed by abscess of the liver, I cannot from my own

experience admit. I have during the last eight years treated more cases of dysentery than any other disease, but I have never seen a single case followed by abscess of the liver, unless it were in a person addicted to drink. I have never seen or heard of a case of dysentery in children followed by hepatic abscess. Dr. Murillo has seen but one case of hepatic abscess in women, but he does not state that it came on after dysentery. And yet this latter complaint as frequently attacks women as it does men. I conclude, therefore, that, whilst no doubt can be entertained as to the noxious influence of the combined effects of climate and drink upon the functions of the liver, dysentery cannot be held accountable for hepatic complications, unless occurring in subjects given to alcoholic excesses.

ART. XV.—*Report of a Case of Gunshot Wound of the Right Knee-Joint and Right Hand.* By GEORGE M. KOBER, M.D., Acting Assistant Surgeon U. S. Army.

SERGEANT EDWARD McM., æt. 24 years, left this post Dec. 5th, 1874, for the purpose of hunting. It appears he had hidden his gun in the sage-brush the day previous, and, leading his horse with the left hand, he stooped to pick up the piece with the right hand, taking hold of the gun near the extremity of the barrel, the muzzle directed towards his body. Whilst doing so, the piece accidentally discharged its contents (a load of duck shot), shattered the barrel, and wounded the sergeant, whose horse returned to the camp; and one of the men, fearing that some accident had befallen its rider, started in the direction from whence the horse came, and, finding the man disabled, returned to procure assistance. With men and a stretcher I started for the scene of the accident, and found the sergeant wounded in the right-knee and hand. The hemorrhage and shock were comparatively slight, and the patient was at once removed to the hospital.

After removal of the clothing, the wound of the knee was carefully examined, and it was found that the load had entered near the tuberosity of the external condyle of the right femur, passed obliquely upwards and inwards, and escaped near the lower part of the semitendinosus muscle. Small fragments of the bone were found in the wound, and, together with pieces of wadding, clothing, and dirt, removed.

From the fearful proximity of the gun when exploded, the charge had made a similar wound to that produced by a bullet, and owing, no doubt, to the flexed position of the joint, and the oblique direction of the load, the wound was more superficial in character, involving, however, the tuberosity of the external condyle, the lower part of the biceps, and the internal hamstring, which was severed. Capillary hemorrhage was controlled by injections of cold water through the wound, which also served to remove loose remaining foreign particles. A lotion composed of aquæ font. Oij; alcohol, ℥vj; acid. carbol. cryst. ℥j, was faithfully applied every twenty minutes, and an attempt made, in accordance with

the patient's strong wishes, to treat the case on the expectant plan. I now directed my attention to the wounded hand, and found that the soft parts of the palmar surface, particularly the flexor brevis and abductor minimi digiti muscles, were extensively lacerated, and the first phalanx of the ring finger totally deprived of its soft parts. After giving the patient two ounces of whiskey, I amputated the finger (by flap operation) through the middle of the second phalanx. The lacerated soft parts of the hand were replaced and secured by sutures and adhesive strips. The above lotion was also applied to the wounded hand, and ¼ grain of morph. sulph. administered. The following mixture was ordered to be repeated every three hours, while the patient continued awake:—

℞. Morphiæ acet. grs. ij; spt. æth. nitr. ℥ij; sacchari albi, ℥ij; aquæ camph. f℥iiiss; liq. ammon. acet. f℥iv.—M. ft. mist.

A tourniquet was applied loosely over the femoral artery, and instructions given in case of hemorrhage.

December 6, 7 A. M. Pulse 100. Has slept some, feels pretty well, experiences no discomfort in the wounded members; anodyne and local applications to be continued. 9 P. M. Pulse 116; skin covered with gentle perspiration; has slept several hours during the day.

7*th*, 7 A. M. Pulse 103; has slept more or less during the night; expresses himself comfortable. The wounds were syringed with warm carbolated water (Oij–℥j), and a pledget of lint saturated with carbolated glycerine (℥ij–℥j) was introduced into the opening of the wound near the external condyle. The lotion and anodyne mixture to be continued, and ℥iv of sol. magn. citr. repeated every four hours until an evacuation of the bowels is procured. 9 P. M. Pulse 101; feels comfortable; perspires gently. Anodyne mixture suspended.

8*th*, 7 A. M. Pulse 95; slept but little on account of flatulency; bowels moved this morning; feels comfortable, but weak. Wound of the knee discharges freely shreds of necrosed tissue—syringed out with warm carbolated water. The hand looks favourable, healthy granulations are seen in the lacerated tissues, and the stump of the finger promises to heal by first intention. Local and general treatment continued. 9 P. M. Pulse 105; anodyne mixture every two hours until sleep is induced.

9*th*, 7 A. M. Pulse 93. Has slept comfortably; a slight discharge of laudable pus from the orifice of the knee wound is perceived. Wound syringed out with warm carbolated water, and carbolated pledget of lint introduced. Sutures from the stump of finger and hand removed, and dressed with carbolated cosmoline; warm carbolated-water dressings to be applied every hour to the knee. Valentine's meat juice, milk diet, and five grains citrate of iron and quinia three times a day. 9 P. M. Pulse 107. Anodyne mixture every two hours until asleep.

10*th*, 7 A. M. Pulse 92. Has slept well. Discharge from the knee wound moderate. 9 P. M. Pulse 106. Anodyne mixture every two hours.

11*th*, 7 A. M. Pulse 92; feels pretty well; appetite good; discharge moderate. Treatment continued, and a dose of magnesia and rhubarb given. 9 P. M. Has had a passage; complains of no pain. Anodyne mixture, if necessary, to procure sleep, and this to be given every night if required.

12*th*, 7 A. M. Pulse 90; has slept well. Discharge moderate. Local and general treatment continued. At noon, complains of pain and tenderness in the knee; swelling, which has been moderate heretofore, more

marked. A dose of the anodyne mixture and warm local applications repeated every fifteen minutes produced ease and comfort. 9 P. M. Pulse 105. No pain.

13*th*, 7 A. M. Pulse 94. Has had a comfortable night's rest. Appetite good, partakes freely of meat juice, chicken soup, and milk. Discharge moderate. Healthy granulations about the orifice of the wound. Hand looks well. General and local treatment continued, and two ounces of sherry wine three times a day.

14*th*, 7 A. M. Pulse 89; has slept well, and expresses himself comfortable; appetite good; discharge considerable. Local and general treatment continued. Bowels moved by an enema of warm water.

15*th*, 7 A. M. Pulse 96. Slept pretty well. Discharge more plentiful than is compatible with a normal process. Local treatment continued, and five grains of quiniæ sulph. added to each dose of the citrate of iron and quinia. 9 P. M. Pulse 105. Anodyne mixture if required.

16*th*, 7 A. M. Pulse 90. Has slept well; feels comfortable. Treatment continued, except a substitution of whiskey for the wine, as the latter appears to disagree with the milk diet.

17*th*, 7 A. M. Pulse 86. Has rested well. Discharge from wound of the knee considerable. Treatment continued. Bowels moved by an enema of warm water. 9 P. M. Pulse 90. Bowels moved twice since the enema was given.

18*th*, 7 A. M. Pulse 86; has slept but little without the anodyne mixture. Wounds dressed as usual. Treatment continued. In the afternoon, feels feverish; pulse 108. Diaphoretic mixture given.

19*th*. At 7 A. M. pulse 84; slept but little; wound of the knee discharges a large amount of pus. Suppuration of the joint suspected; swelling and darting pains marked. Carbolated glycerine pledget and warm applications still continued.

20*th*, 7 A. M. Pulse 92; slept very well; discharge copious; wounds dressed as usual; treatment continued. At 9 P. M. pulse 108.

21*st*, 7 A. M. Pulse 90; slept well; discharge copious; stump of the finger entirely well; hand requires but simple cosmoline dressing; treatment continued; more swelling of the joint and neighbouring tissue. Apprehensions as to a successful issue of the case under the expectant treatment entertained. It is quite certain that suppuration of the joint has taken place, and possibly inflammation of the connective tissue in the vicinity particularly of the fascia lata. The nature of the case explained to the patient, and his chances for life without operative interference clearly pointed out. Amputation proposed as his only good chance for life, but the patient objected, and seemed quite willing to embrace the worst chances. 9 P. M., pulse 104.

22*d*, 7 A. M. Pulse 94; slept more or less during the night; discharge from the knee wound copious and fetid; treatment continued. At 9 P. M. pulse 108.

23*d*, 7 A. M. Pulse 95; slept well; wound discharges fetid pus; treatment continued. 9 P. M., pulse 104.

24*th*, 7 A. M. Pulse 110; has had a chill during the night, followed by fever and profuse perspiration; discharge copious and offensive; local and general treatment continued; increase the quinia to 10 grains in addition to the citrate of iron and quinia, and the whiskey to 8 ounces per day. There is marked tenderness over the patella, and fluctuation along the outer aspect of the thigh. Injected warm carbolated water into the

exit wound, for the purpose of removing shreds of necrosed connective tissue, and followed it with an injection of carbolated glycerine (ʒij–ʒj), one fluidrachm was injected at the time. The discharge makes its escape through the exit wound. An incision was made for the escape of pus on the outer aspect of the thigh. 9 P. M., pulse 109.

25*th*, 7 A. M. Pulse 102; slept pretty well; has had a night-sweat. Discharge from the wound copious and offensive; appetite very good. Local treatment continued; acid. sulph. arom. gtt. xv, with 10 grains of quinia three times a day; opium gr. j at bedtime. 9 P. M., pulse 115.

26*th*, 7 A. M. Pulse 110; discharge the same in quantity and quality; treatment continued; hectic flush well marked; appetite good; in spite of the unfavourable change patient appears quite cheerful. 9 P. M., pulse 112; tr. opii gtt. xxv at bedtime.

27*th*, 7 A. M. Pulse 96; slept pretty well; perspired some; discharge still copious and offensive; treatment continued. 9 P. M., pulse 108; has had a good appetite, and feels comfortable; tr. opii gtt. xxv at bedtime, to be repeated if necessary.

28*th*, 7 A. M. Pulse 95; slept pretty well; discharge unchanged in character and amount; treatment continued. 9 P. M. pulse 112.

Perhaps it will be too tedious to follow up the details of the case as exhibited by the daily record; suffice it, then, to say that the case, in spite of all treatment, assumed the form of chronic suppurative inflammation of the knee-joint, complicated at various times with the formation of abscesses in close proximity to and above the joint. February 22d an examination while the patient was under the influence of ether satisfied me that no caries of the bone existed. The entrance wound had been closed by granulations, and in place of the exit wound existed a fistulous opening, which appeared to communicate with the joint, the popliteal space, and higher up. It seemed as if all the connective tissue in the vicinity had been the prey of inflammation, and was now presenting a sluggish granulation tissue, and that this low form of inflammation had a tendency to spread upwards beyond the middle of the thigh. The enlarged white and bloodless appearance of the joint, the tendency to pointing in several places, the fatty and cheesy character of the discharges, indicated to me that there no longer existed an active inflammation, but that I had to deal with a low form of inflammation incapable of generating normal tissue. The cheesy odour of the discharge, which was seen to consist, under the microscope, of pus cells, irregular nucleoli, and an ill-defined detritus, fragments of cells and disorganized connective tissue, and indistinct finely granular and fatty masses, reminded me involuntarily of the microscopical character of tubercle. I became convinced that in order to benefit the patient without resorting to an operation (to which he still objected), I must resort to other means than those heretofore applied. At this time my eye met the article of Mr. Richard Barwell on the treatment of chronic strumous synovitis, more especially of the knee (vide *American Journal of Medical Sciences* for January, 1875), and I was greatly pleased with the treatment suggested by him. I determined to use a solution of iodine as directed by him, viz., tr. of iodine, ʒss; water, ʒvijss, and I added 16 drops of pure carbolic acid. On account of the fistulous opening I employed a glass penis syringe, instead of a hypodermic syringe, and injected one drachm of the solution once a day, and by manipulation endeavoured to bring the injection in contact with the tissues involved. Scarcely any pain followed the use of these injections, and after their faithful employ-

ment for a month I believed that I was doomed to disappointment, at least I could perceive none of the brilliant effects I had pictured to me. Upon reflection, however, I considered that my failure had its origin first in the strength of the solution, and second in the formation of abscesses in the cellular tissue far above the point of application. I therefore increased the strength of the solution, using tr. iodine, ℥j; glycerinæ, ℥vij; acid. carbol. cryst. gtt. xvj, and, finding that the object was still unattained, cautiously and gradually increased the strength until it reached the following proportion: R. Tr. iodinii, ℥vj; glycerinæ pur. ℥ij; acid. carb. cryst. gtt. xvj.—M. ft. sol. One drachm of this strong solution was injected at a time into the fistulous opening at intervals of three days, and it was not until after three weeks' employment that the smarting and pain it produced satisfied me that the desired effect would be obtained. The joint gradually assumed a healthy appearance in size and colour, and healthy granulations filled up the undermined tissue in the popliteal space. The fistulous opening was allowed gradually to close.

After this I had to contend with the formation of two abscesses in the cellular tissue, midway of the thigh, and upon its outer aspect. These were opened, and after the evacuation of the pus two drachms of the solution were injected. June 28th, the last abscess which had formed in the gluteal region spontaneously opened, and after the evacuation of the pus two drachms of the solution were injected. This seemed to excite the sluggish tissue to normal cell formation, and the last of the abscesses finally closed.

The drain to the system by excessive suppuration, the absorption of disintegrated products of inflammation, the consequent hectic fever, had left their impress on the patient's system and vital powers, and at times he seemed to be on the very brink of death. Liberal doses of quinia and whiskey, and the patient's ability to partake freely of nutritious food, kept him afloat until the iodine gradually but surely changed the character of the disease. I am perfectly satisfied that nothing but the iodine of the strength which I employed brought about the favourable change, and therefore regard it a most excellent remedy, not only in cases in which Mr. Barwell employed it, but also in all cases where the surgeon is obliged to treat a case of gunshot or other wound involving the joint, which has assumed the character of chronic inflammation, on the expectant plan, instead of resorting to the knife. The patient has recovered with an anchylosed joint, and after performing for several months the duties of an acting commissary sergeant, was discharged April 2d, 1876, from the service.

CAMP MCDERMIT, NEVADA, May 13, 1876.

ART. XVI.—*Intussusception; Cure by Inflation.* Read before the Medical Society of Yokohama, Japan, June 17, 1876. By STUART ELDRIDGE, M.D., Surgeon Yokohama General Hospital.

JUNE 11th, at 6 P. M., I was called to see J. G., aged 17 months, in general remarkably strong and healthy. The child had been ailing for several days, with constipation and slight fever at night, seemed also to

have frequent attacks of colic. On the evening of June 10th, the mother administered a dessertspoonful of ol. ricini, which brought away a small amount of consistent feces after intense tenesmus and severe pain. During the night of 10th, and all day of 11th, the child had suffered from very severe attacks of abdominal pain, which it seemed to refer to region of transverse colon. Repeated attacks of nausea and vomiting of mucus and biliary matter occurred during 11th, the vomiting taking place irrespective of ingesta. When seen the pulse was 140, wiry and small; temperature 103.5°; skin hot and dry; tongue thickly coated; abdomen largely swollen, hard, tympanitic, and extremely tender. A lump, apparently of the size of a small egg, could be indistinctly felt about region of right flexure of colon. Paroxysms of intense pain occurred at intervals of about fifteen minutes, during which the child placed its hands upon the upper portion of the abdomen with cries of itai! itai! (pain! pain!). Nausea constant, but ejecta, if any, again swallowed. The mother had an hour previous to my visit administered an ordinary enema without effect. I immediately gave an enema of soap and water, through a catheter inserted five inches in the anus; about half a pint was all that could be given, and this returned immediately, bringing with it about three drachms of consistent feces. Suspecting that the case was one of intussusception, I then thoroughly inflated the bowel by the reversed action of Codman & Shurtleff's aspirator, the air being transmitted through a No. 12 gum catheter inserted ten inches within the anus. The operation of inflation seemed very painful. I inflated until the sense of resistance and swelling of the abdomen became considerable, when, on withdrawing the tube a rush of air followed, and I was pleased to find that the abdomen was softer, and less swollen than before the operation. The tumour in right upper portion of abdomen was also, I thought, a trifle smaller. I repeated inflation at once, but with no increased effect. Prescribed tr. opii, ♏iij, at intervals of three hours during night, together with a teaspoonful of ext. carnis. The child was more easy during the night of the 11th than it had been during the day; but early on the morning of the 12th, began to have frequent small dejections of pure blood, with once or twice a slight admixture of mucus. At 8 A. M. on the morning of 12th I found the pulse 145; temperature 104°; skin hot and dry; tympanites and tenderness of abdomen even greater than at first visit. Constant nausea, with stercoraceous odour of breath. I at once inflated, compressing the buttocks strongly about the pipe, which was passed 12 inches within the anus. Resistance to inflation was more strongly marked than on the day before, and occurred at an earlier stage of the operation, while in spite of strong compression of external parts about the pipe most of the air injected seemed to escape as fast as thrown in. I worked the syringe with great rapidity for about thirty strokes, when the sense of resistance suddenly diminished, and the escape of air by the side of the pipe ceased. I continued inflation until the air began again to escape from the anus, when I withdrew the instrument; an enormous escape of air took place, mixed with intestinal gases, as perceptible by the odour, and on examination of abdomen I found it soft, collapsed, and the induration about right flexure of colon no longer perceptible. Nausea and vomiting immediately ceased, and did not recur. Prescribed: Tr. opii camphoratæ, ʒijss; bismuthi subnit. ʒj; aquæ camphoræ, ʒss; mucilaginis ad ʒij; coch. parv. j altern. hor. Beef extract to be continued, together with an occasional spoonful of iced milk. At 2 P. M. the child had a free, healthy stool, after which no

trouble appeared to exist save a slight tenderness over transverse colon, lasting for twenty-four hours, together with some general muscular weakness. The child has continued well in every respect till to-day, June 17th. Believing, as I do, that inflation holds out the best prospect of cure in cases of intussusception, it seems to me that certain data should be in the possession of the profession in order that its employment may be intelligently regulated. We should know the limit of endurance of pressure from within, belonging to the average healthy intestine at various ages within the usual time of the occurrence of the disease.[1] Possessed of this information the surgeon acting early, before the probable occurrence of softening or gangrene, would be able to push his treatment to the utmost limit of safety, guiding himself by a manometer attached to his injecting apparatus.

ART. XVII.—*A Case of Traumatic Aneurism of Right Common Carotid; Operation of opening the Sac; Internal Jugular Vein being wounded is also ligated; Recovery.* By GEO. E. FROTHINGHAM, M.D., Prof. of Ophthalmology, University of Michigan.

ON the night of August 16, 1875, H. O., aged twenty-three, was injured by the explosion of some powder kept in a store, which he and others were attempting to save from burning. At the time of the explosion he was standing in front of the show window, and together with some of his companions was thrown several feet toward the centre of the street, and was for a moment rendered almost insensible. I was called to see the patient about an hour after the injury, and found him suffering great depression, fainting upon the least attempt at a sitting posture. His face was covered with scratches caused by pieces of glass and other solid particles thrown in every direction by the exploding powder. Among his injuries were two penetrating wounds of the right side of the neck, one near the antero-inferior angle of the sub-occipital triangle, and the other just at the apex of the inferior carotid triangle.

The openings in the integument had the appearance of having been cut by some particles of glass, and were between one and two lines in length. The external hemorrhage had ceased soon after the injury, but a diffuse aneurism had been formed, extending from the angle of the jaw to the clavicle, and pressing the trachea slightly to the left and interfering with deglutition. An examination with a probe showed that the fragment that had entered at the upper opening had glanced upward and probably lodged in the tissue behind the external ear, though it could not then be felt. The probe could not be made to follow the lower wound.

The voice of the patient was reduced to a mere whisper.

Rest in the recumbent position was enjoined; the right eye, which had

[1] I am not aware that any experiments of the kind mentioned have as yet been made, at least I can find no reference to them in any work to which I have access. Opportunities for such investigation but rarely occur with us in the East, and would require in order to be worth anything the examination of a large number of bodies.

also been wounded, was attended to; and the symptoms carefully watched, the attendant being instructed to call me immediately should the tumour in the neck enlarge or the difficulty of swallowing increase.

By morning deglutition could be performed with less difficulty, and the tumefaction of the neck showed no tendency to increase. I was thus encouraged to pursue the expectant plan, hoping that the main artery was not wounded, but that the effused blood had been poured out from a wound of some of its branches, and a spontaneous cure might be possible.

By the fourth day, however, the bruit became more distinct, and indicated very clearly that the artery wounded was the common carotid.

From this time until August 31st, the tumour became more circumscribed, projecting more just over the point where the artery was wounded, and leaving a slight depression between it and the clavicle.

During this interval, the weather had been comfortable, and the condition of the patient somewhat improved, he being able to sit up for a few moments without the marked symptoms of syncope that at first prevented this posture. The weather now became warmer, and by September 3d, the tumour showed a decided increase in size, and kept steadily enlarging.

By the 6th it became painful, and on the 8th it was extremely painful, the patient requiring large doses of morphia to procure rest. The tumour now extended from the angle of the jaw to the clavicle, pressing the trachea well over to the left, and projecting full two inches beyond the ordinary level of the neck. A slight depression or groove existed between the tumour and the clavicle.

The symptoms being thus urgent, I decided to delay no longer, but operated Sept. 9th, twenty-three days after the injury. The operation was commenced at 3 P. M. The patient having been put under the influence of ether, the sternal and inner half of the clavicular attachment of the sterno-cleido-mastoid muscle were divided together with skin and fascia covering it. An incision was next made through the skin and deep fascia at the lower portion of the neck just at the inner border of the sterno-mastoid, and a trusty assistant was directed to compress with his thumb the lower portion of the common carotid. In exercising the necessary pressure the thumb broke through the thinned wall of the sac, but was brought immediately upon the artery, compressing completely its lower portion, and with the effect to very greatly lessen the pulsation in the tumour. A narrow incision was now made through the most prominent portion of the tumour, the forefinger of the left hand plunged in, and the wound in the artery felt for. After a little search this was found, and compression exercised so as to completely stop the pulsation in the tumour. The sac was then laid freely open, the clots turned out, the cavity sponged, and the wound was now found to be in the common carotid just below the lower border of the omo-hyoid muscle. The muscle was drawn upward, and, upon examining the posterior wall of the sac, the tissues of which were much altered in appearance, a considerable vein was seen to cross the artery at this point and enter the internal jugular, which, as is usual in such cases, almost completely overlapped the artery.

In attempting to draw it to one side, its walls, probably softened by inflammatory action, gave way, and a fearful gush of venous blood was the result. This was instantaneously checked and controlled by pressure. A ligature was now thrown about the artery above and one below the wound. The internal jugular was next ligated above and below the point of injury, and the vein entering it here had also to be ligated, making five

ligatures in all. The wound was well cleansed, its edges brought together by sutures, the ligatures brought out near the inferior angle, a compress was applied, and the patient placed in bed. 6 P. M. The patient has completely rallied from the effect of the anæsthetic, is resting nicely, and free from pain.

The next morning at 6 A. M. found the patient feeling comfortable. Pulse 100. He had rested well through the night, but his mind was slightly confused, though there was no headache nor any marked cerebral disturbance. He was able to take food more freely than for several days prior to the operation.

From September 10th to 14th the patient felt very comfortable; the wound looked healthy; pulse varied from 88 to 100; temperature of body from 100° to 101½°. On the 14th the body temperature rose to 104° in the evening; wound doing well.

Sept. 15, 8 A. M. Pulse 100, temperature 100½°, feeling comfortable. 5 P. M. Pulse 110, temp. 104°, feeling feverish and thirsty.

16*th*. Same symptoms repeated at about the same hours.

17*th*. From 1 A. M. to 3½ P. M. administered 16 grs. of quinia, in four doses of 4 grs. each. 10 P. M. Temp. 99¾°, wound doing well. After this the temperature never exceeded 100°, the pulse ranging from 76 to 88.

21*st*. All the ligatures came away except the lower one surrounding the internal jugular vein. This ligature did not come away until October 8th, 29 days after the operation. The recovery was now completed in a short time. The wound in a few days completely closed. In a few weeks the strength was recovered, and the patient is now perfectly well, though the voice has remained permanently impaired.

The only full notes of a similar operation that I have seen are recorded at page 831 of *Syme's Surgery*. In his operation he was greatly embarrassed for room to manipulate in the wound after opening the sac, and was obliged to divide the sternal attachment of the sterno-mastoid muscle while one hand was engaged in compressing the artery. His experience led me to divide this muscle with the superjacent structures as a preliminary step to the operation.

From this measure, which added nothing to the danger of the operation, I derived great advantage, having plenty of room to manipulate in the wound, without which I could hardly have managed so easily the double source of hemorrhage.

Syme declared this case of his to have been the most arduous that ever occurred in the course of his surgical experience. In reporting his case he says:—

> "Indeed, even now I cannot, without a shudder, reflect on my position, when the slightest displacement of one hand must have instantaneously caused a fatal hemorrhage from the carotid artery, and a wrong direction of the needle by the other, to the slightest extent, would have given issue to an irrepressible stream from the jugular vein."

By the method of operating which I adopted, and which may be employed when the wound in the vessel is not too low down, the compression of the artery may be left to a skilled assistant, leaving both hands of the operator free to manage the hemorrhage from a wound of the jugular vein

should it occur. And in our day the ligation of that vein is not regarded by the surgeon with such serious apprehension as it was at the time when Syme made his operation.

In this operation I am indebted for valuable assistance to my colleagues Prof. Donald Maclean and Prof. H. S. Cheever, and also to Dr. John Kapp, of Ann Arbor.

ART. XVIII.—*Case of Embolism and Thrombosis of the Pulmonary Arteries, which was rapidly fatal.* By ISAAC G. PORTER, M.D., of New London, Conn.

AMONG the internal causes of sudden death, we may enumerate—1st. The bursting of aneurisms, the result of atheromatous deposits in the large bloodvessels near the heart. 2d. The rupture of the heart itself, mainly through the influence of fatty degeneration. 3d. Valvular diseases of the same organ; although, of late, this cause is regarded as really less operative than was formerly supposed. 4th. In an interesting article in the last number of this Journal "Spasm of the heart" occupies a place in the same grave category. 5th. The "heart-clot" of Meigs, in puerperal women, or cardiac thrombosis. 6th. Extravasation and effusion of blood at the base of the brain, from disease and rupture of the arteries; also, large hemorrhages into the substance of the brain from the same cause, or from embolism, constituting apoplexy. 7th. Another similar factor, unknown and unsuspected until elucidated by Virchow, his compeers and successors, is exemplified in the case now to be detailed, viz., embolism and thrombosis of the pulmonary arteries. As remarked by Aitken, "results are now explained on simple mechanical principles which hitherto have been obscure. Formerly many of the cases thus explicable would have been recorded as cases of 'sudden death,' or as 'sudden retrocession of gout or rheumatism,' or 'gout in the stomach,' or 'palsy of the heart.'"

April 30, 1876. Called to H. P. H., of this city, merchant, sixty-one years of age, weighing 180 pounds; in appearance robust and somewhat plethoric, with capacious and fertile brain. His pulse for a man of his size was always small and weak, yet his health was ordinarily fair, having never had rheumatism or any cachectic disease, and, by ordinary rules, entitled to longevity by right of inheritance. Still he was always, voluntarily, overworked, unceasingly active seven days in the week, maintaining, for more than forty years, a Sabbath-school in a destitute region five miles distant, besides superintending the largest similar institution in town. For two weeks before his death he complained of unusual weakness, and had a slight bronchial cough. Still he attended to business,

and rode out the day before his death, driving the horses himself. He passed a restless night, but arose as usual, and among other things exerted himself in visiting the observatory at the top of the house. But he returned almost immediately, became faint and breathless, and barely reached the lower floor, when he almost fell into the arms of his family. I reached him very soon (at 7.45 A. M.), and found him cold and in profuse perspiration; countenance pale and ghastly; pulse very rapid, irregular, and scarcely perceptible. He was very restless, though without true pain, and complained earnestly of being faint and as having no breath, although at the time filling his lungs completely at every inspiration. The difficulty was not increased by the horizontal position, and yet he preferred to sit up, supported by friends. Stimulants conferred momentary relief, and sinapisms and external warmth were freely used, but in about half an hour his head fell on his breast, and he was gone, remaining conscious to the last.

A *post-mortem* examination was made at 4 P. M. by A. W. Nelson, M.D., assisted by other physicians of this city; but as the heart alone was examined, and there was found no very unusual amount of clot in the right side of the heart, the examination was not carried to the lungs, although we were disappointed in finding so little to explain the peculiar mode of death. At the suggestion of a son of the deceased, a student at the Harvard Medical School, the assistance of R. H. Fitz, M.D., Assistant Professor of Pathological Anatomy at that institution, was cheerfully sought, and I now have the pleasure of presenting the following letter from one so accomplished in his department as Professor Fitz, to whom the heart and lungs were forwarded, and which reveals the true cause of death, as well as the benefits of sometimes minutely examining organs which were not suspected of being mainly in fault.

"The examination of the organs sent me has proven satisfactory as to the cause of death, which was embolism and thrombosis of the pulmonary arteries.

"The left ventricle of the heart was moderately dilated and hypertrophied—this condition being evidently due to chronic changes of the aortic orifice resulting in insufficiency. The septum between two of the crescents had almost wholly disappeared, the corpora aurantii of these were approximated, and the leaflets somewhat thickened and contracted. The appearance was thus presented as if but two semilunar valves of unequal size existed at the aortic opening.

"This condition gives the most probable explanation of the constant small and feeble pulse, as the appearance of the wall of the heart was not suggestive of any special degree of fatty degeneration.

"In one of the secondary branches of the pulmonary artery of the left lung, an adherent and slightly decolourized clot was found, which had probably been in position some days.

"From this a more recent coagulation extended towards the common pulmonary arteries of both lungs, and was continued into the main artery of the right lung, filling it and the primary auricles.

"The arborescent clot was thus formed—its ends rounded and pointed passing from one and a half inch to one inch into the primary branches. Beyond its ends the blood was still fluid.

"The *besoin de respirer* and the ability to inflate the lungs are thus quite compatible, the bronchiæ not being obstructed, but the blood not capable of aëration. Death is thus immediately produced by a lack of oxygenated arterial blood in the nervous centres, notably in the medulla oblongata.

"A certain degree of bronchitis existed, of no importance in respect to the sudden death. The heart did not indicate the seat of the original embolism, which may have been in the right side of the heart or in any of the body veins."

The closing sentence of the above letter leads me to say that, some eighteen months before his death, the patient made an overland journey to California, and, as he thought, through long and persistent confinement in the cars, his left leg and foot became very painful and swollen, so much so that for some time after his arrival, he was disabled for business, and was under the care of a surgeon, and by him kept very quiet in a horizontal position. The pain left him after a time, but the limb remained swollen quite to the time of his death, though it did not particularly incommode his walking.

In this connection the writer would add that his patient was careful of health and life as a duty, and in pursuance of the same was in the habit of using daily the "health-lift." About two weeks before his death, while exercising among the small hundreds, and he had nearly reached his accustomed allotment—without his knowledge and purely as an accident —the "slide," which, by its action, increases the weight to be lifted, had been moved. Feeling *bound* to do again what he had often done before, he exerted himself greatly and quite to his injury. The week after, he called at my office, stating the fact, and that he had felt unwell ever since. It may have been a vain fear; but on the other hand, when it is asserted of the machine "that the lifting effort is made entirely through the action of the muscles of the lower extremities in straightening and bending the knees," may we not inquire whether some old formation that had hitherto laid dormant, may not have been disturbed by the powerful action of the muscles on the crural veins, breaking down and detaching venous thrombi? That thrombosis, occurring in the peripheral veins, not unfrequently leads to embolism of the pulmonary arteries is shown by the following statement of Niemeyer:—

"Within the last few years I have seen two cases, in which death occurred in the course of a few hours, with all the signs of intense dyspnœa and collapse, and in which it was found, *post-mortem*, that a large thrombus had been detached from the femoral vein, had passed into the circulation, and by obstruction of the main branch of the pulmonary artery, had occasioned this peculiar kind of suffocation." (Vol. i. p. 412.)

In the case which has received our chief attention, the persistent œdema of the limb would imply continued, but diminished obstruction of the vein or veins of the extremity. Aitken speaks of cases "where the coagulum adheres only to one wall, with the effect of narrowing the passage," etc.

The testimony of Prof. Fitz will be remembered, viz, "the heart did not indicate the seat of the original embolism." The point has probably never been settled how long a venous obstruction may remain quiescent, and yet ultimately break up and be detached to enter the circulation. The following caution, however, will be harmless, even though unjustified by the premises: The use of the "health-lift" is often attended by great advantages; but if our speculations are founded in truth, we can scarcely recommend the instrument in cases where œdema remains after the existence of what used to be called phlebitis of the lower extremities.

(Article XIX.)

A CENTURY OF AMERICAN MEDICINE.
1776—1876.

IV.
LITERATURE AND INSTITUTIONS.

By John S. Billings, M.D., Assistant Surgeon U. S. Army.

"Wherefore, by their fruits ye shall know them."

Besides his duties to his patients, the physician is under certain obligations to contribute, by way of interest, his quota to the common stock of medical knowledge from which he has drawn so freely. The skilful diagnosis, judicious medication, or bold and successful operation, if not properly recorded, benefit the individual only, not being available for those comparisons and higher generalizations which alone can make medicine a science. By the manner in which this duty, of preserving and transmitting the results of its labour and experience, has been performed, the medical profession of a country, as well as the individual physician, must to a great degree be judged, and the question now presented is, to what extent and in what manner have the physicians in the United States fulfilled this part of their professional obligations during the century just passed.

In the retrospective reviews, historical sketches, and centennial addresses which have, during the past year, been devoted to American medicine, our most important contributions to the healing art have been duly pointed out, and for the most part sufficiently eulogized. That the United States has a medical literature, has been cumulatively demonstrated, even to the extent of raising a suspicion of the existence of a doubt upon this point; and that this literature contains many valuable original contributions to the art, if not to the science, of medicine may be considered as unanimously affirmed and admitted.

If the defects of which all are more or less aware, have been but slightly referred to, it is because the purpose of the writers has been rather eulogistic than critical. In this final article of the present series, the object is not to select for praise the best of the work, nor the reverse, but to endeavour to give an idea of the quantity and value of the whole of it. So far as individual writers are concerned, an attempt will be made to supplement the information given in previous papers, but these have been so complete as regards that which is worthy of notice, that little need be said of single books and articles.

We will first endeavour to give some account of the quantity of medical literature produced in the United States during the last hundred years; making use for the purpose of some statistics obtained from a nearly complete list of the medical books published in this country from 1776 to the present time, and from which it may be considered certain that no important work has been omitted.

In these statistics we do not include works intended for the non-medi-

cal public, those relating to "ics" or "pathies," nor the great mass of what are called pamphlets in the technical sense of the word, that is, books of less than one hundred pages. The great majority of these pamphlets are either reprints from periodicals, addresses inaugural or valedictory, a few of which contain historical data of interest, or controversial and personal disquisitions which are best forgotten. While it is true that there is no necessary connection between the size of a work and its practical or scientific value, it will be found that with a very few exceptions, which have been pointed out in the preceding articles of this series, nothing of interest or importance is omitted by this division. The books to be counted may be classified as follows :—

I. Systematic treatises and monographs by physicians residing in this country, including reports of hospitals, corporations, and government departments.
II. Reprints and translations of foreign medical books.
III. Medical journals.
IV. Transactions of medical societies.

The first, third and fourth classes include what is ordinarily meant by the phrase "American Medical Literature." From them are excluded books written by American authors, but printed abroad, as, for instance, those of Dr. Wm. Charles Wells ; while on the other hand, they include books written by physicians born and educated abroad, but who may be said to have become citizens of this country, such as Tytler, Pascalis, Bushe, Dunglison, Jacobi, and Knapp.

The statistics of the four classes above given, include not only the medical literature of the United States for the century, but nearly all which the country has produced since the first settlement. At the commencement of the Revolutionary War, we had one medical book by an American author, three reprints, and about twenty pamphlets. The book referred to is the "Plain, Precise, Practical Remarks on the Treatment of Wounds and Fractures," by Dr. John Jones, New York, 1775. It is simply a compilation from Ranby, Pott, and others, and contains but one original observation, viz., a case of trephining followed by hernia cerebri.

The libraries of our physicians were composed, according to Bartlett,[1] of the works of Boerhaave, with the Commentaries of Van Swieten, the Physiology of Haller, the Anatomy of Cowper, Keil, Douglass, Cheselden, Monroe, and Winslow.; the Surgery of Heister, Sharp, Le Dran, and Pott; the Midwifery of Smellie ; the Materia Medica of Lewis ; and the works of Sydenham, Whytt, Mead, Brookes, and Huxham. The works of Cullen were just beginning to be known. The only public medical library was that of the Pennsylvania Hospital, which contained, perhaps, two hundred and fifty volumes. There were probably not two hundred graduates of medicine in the country, and not over three hundred and fifty practitioners of medicine who had received a liberal education. Two medical schools had just begun, but had accomplished little previous to the war which closed them, there were no medical journals, and but one State Medical Society, that of New Jersey, had been organized. From this unpromising condition of things, have been developed the literary results, of which we now present a summary.

[1] A Dissertation on the Progress of Medical Science in the Commonwealth of Massachusetts, Boston, 8vo., 1810.

Table showing number of Medical Books printed in the United States from January 1, 1776, to January 1, 1876.

		1775 to 1799	1800 to 1809	1810 to 1819	1820 to 1829	1830 to 1839	1840 to 1849	1850 to 1859	1860 to 1869	1870 to 1875	Total.
Class I.											
American Medical Books	No. 1st edition	39	24	51	48	83	96	101	157	130	729
	No. later editions	9	4	14	17	34	49	80	85	44	336
	No. Vols. Total	51	31	77	86	136	162	197	256	180	1176
Class II.											
Reprints and Translations	No. 1st edition	28	39	64	72	145	135	99	104	81	767
	No. later editions	11	23	28	33	36	67	76	64	50	388
	No. Vols. Total	49	76	111	135	192	214	184	160	137	1274
Class III.											
Medical Journals	No. Journs. com'ced	1	5	6	17	18	26	52	38	32	195
	" " discont'd	.....	3	5	10	18	14	31	36	20	137
"A."											
Original	No. Vols. com'nced	2	21	27	85	104	173	376	292	296	1376
	No. Vols. compl'ted	2	20	27	79	98	166	366	271	283	1312
"B."											
Reprints	No. Journals	.....	.....	1	4	.....	5	1	3	3	17
	No. Volumes	.....	.....	9	29	20	46	71	51	32	258
Class IV.											
Transactions Med. Societies	No. Volumes	7	3	2	5	17	27	76	88	111	336

It will be seen from this table, that the medical literature of the United States really commences with the present century, and this is still more apparent, if the character of the works issued prior to 1800, be considered.

The first literary contributions of our physicians, after the close of the war, are contained in the memoirs of the American Academy of Arts and Sciences, Boston, 1785, and in the Transactions of the American Philosophical Society at Philadelphia, 1786. The first original separate work was the "Cases and Observations by the Medical Society of New Haven County, in the State of Connecticut," New Haven, 86 pp., 8vo., 1788. This is a collection of twenty-six articles, including several cases and autopsies, of interest, and a paper on the production of dysentery among troops by overcrowding and foul air, in which the connection of cause and effect is clearly demonstrated.

The majority of the succeeding publications, to the end of the century, related to the yellow fever, which was then epidemic along the whole Atlantic coast. The most prominent author of this period is Benjamin Rush, noteworthy also as an orator and politician. His writings excel in manner rather than matter, and the undoubted influence which he exerted over the earliest stages of American medicine, was probably due to his lectures rather than his published works. The best of his essays, and indeed the only one to-day worth consulting, is that on diseases of the mind, which contains some original observations of interest. One of his eulogists, Dr. Ramsay,[1] says: "On the correctness of this opinion

[1] Eulogium upon Benjamin Rush, by David Ramsay, Philadelphia, 1813, 8vo., pp. 79.

[viz., his fondness for the use of the lancet] his fame as an improver of medicine in a great degree must eventually rest." And to the correctness of this judgment we entirely assent.

The work of James Tytler[1] is a good compilation, and contains, among other data not to be found elsewhere, an interesting letter by Dr. John Warren, of Boston. Tytler was born in Scotland in 1747, came to this country about 1796, and was drowned in 1804; he possessed extensive and varied learning, and wrote much, but for the most part on non-medical subjects.

The works of Noah Webster,[2] though mainly historical, are still of interest, and worth preservation.

Another writer of this period is Dr. William Curry, a native of Pennsylvania, 1755–1829. At first educated for the church, he acquired an excellent knowledge of Latin and Greek, and studied medicine under Dr. Kearsley, of Philadelphia. During the Revolutionary War he served as surgeon in the American army, being attached to the military hospital on Long Island, in 1776. After the war, he at first settled at Chester, but removed to Philadelphia about 1791. He was one of the original fellows of the College of Physicians of Philadelphia, and for many years a member of the Board of Health. His principal works in addition to his numerous pamphlets and articles on yellow fever, are his "Historical Account of the Climates and Diseases of the United States," 1792; and his "View of the Diseases most Prevalent in the United States," Philadelphia, 1811.

Towards the close of the century, and for a few years thereafter, there were published in Boston, New York, and Philadelphia, a number of medical theses, which, being classed as pamphlets, are not taken into account in our statistics, and are noticed here for the sake of saying a word with regard to this class of medical literature. A medical dissertation prepared, not for the press, but simply as a formality necessary for the obtaining of a diploma, as is the case with nearly all those which have been presented at our medical schools for the last fifty years, fairly merits the denunciation of Professor Gross, "that not one in fifty affords the slightest evidence of competency, proficiency, or ability, in the candidate for graduation."

Such was not the case, however, with regard to the theses above referred to, nor can it be justly said with regard to any series of printed theses of the European schools. It would seem, therefore, that when prepared as they should be, with reference to the probable criticisms, not merely of a single professor, but of the press and the public, there is the strongest inducement to refrain from plagiarism, and to produce the best work of which the candidate is capable; and it is well known to those who have had frequent occasion to consult them, that collections of printed medical theses are valuable, as historical documents, presenting a reflex of the teachings of the school, and as containing accounts of cases and original investigations, or particular doctrines of the student's preceptor, which cannot be found elsewhere. The proportion of copied matter, vague speculations, and other rubbish, does not, upon the whole, appear to be so much greater in this than in some other classes of medical litera-

[1] A Treatise on the Plague and Yellow Fever, with an Appendix, 8vo., 1799.

[2] A Collection of Papers on the subject of Bilious Fevers, prevalent in the United States for a few years past. 246 pp. 8vo. New York, 1796. A Brief History of Epidemic and Pestilential Diseases; with the principal Phenomena of the Physical World which precede and accompany them, and Observations deduced from the facts stated. 2 vols., 8vo., Hartford, 1799.

ture, as to warrant their wholesale condemnation; and the remedy for the present unsatisfactory character of the theses of our medical students, appears not to be their abolition, but the requiring that they shall be printed, and considered as an important and real test of the merit of the candidate. They should of course be written in the vernacular. The influence which a teacher has in directing the thoughts of his pupils, is very well shown in the theses of the Philadelphia school, a considerable number of which related to medical botany, under the stimulus given by Dr. Barton to that branch of study.

During this period, and prior to the establishment of any medical journal, or regular publication of the transactions of any medical society, a number of communications from American physicians were sent to societies in Europe, and appear in their transactions. Perhaps the most notable paper of this kind was "An Experimental Inquiry into the Properties of Opium," by John Leigh of Virginia, which obtained the Harveian prize for 1785, and was printed at Edinburgh in the following year. It is worth consultation, not only for the facts which it records, but for the method of investigation pursued, which was unusual in that day of theories.[1]

From the year 1800 to the present time, the above table shows that there has been a steady increase in the amount of our indigenous medical literature, corresponding in the main to our increase in population and wealth. To obtain some notion of the quality and value of this production, a more detailed analysis is necessary.

The greater part of these books are compends relating to the treatment of diseases and injuries. Those which have been most popular, and are the best known, are the text-books and systematic treatises. These are for the most part compilations, but their importance is by no means to be underestimated, for the practice of the majority of the physicians of this country to-day, is based on the text-books of the teachers in the New York and Philadelphia schools. Also we must remember that "there are compilations and compilations." The preparation of such systematic treatises as those of Flint, Gross, Stillé, and Wood, does not require less labour or thought, or give less scope for display of genius, than the so-called original monographs.

Writers of this class bring into their proper relations the isolated facts and observations scattered through many books, give them the mint stamp of value, and put them into general circulation.

For reasons already stated, and for want of space, but few books can here be noticed, even by title, and in connection with these will be given some very brief biographical data relating to a few authors. Of living writers and their works, as little as possible will be said.

In Anatomy our principal systematic works have been produced by Wistar, Horner, Morton, Richardson, Agnew, Hodges, Leidy, and Smith. None of them are now of interest. Dr. Caspar Wistar, 1761–1818, was of German descent, and a native of Philadelphia. Having obtained a good classical education, he studied medicine under Dr. John Redman,

[1] In this connection also may be mentioned a rare and little known work, being the oration delivered at the University of Virginia in 1782, by J. F. Coste, the Medical Director of the French Forces. Its subject is "Antiqua novum orbem decet medico philosophia;" it is dedicated to Washington, of whom the author was a personal friend, and makes a volume of 103 pages, 8vo.; printed at Leyden, in 1783.

and took the degree of Bachelor of Medicine, in 1782. He continued his studies at Edinburgh, where he graduated M.D. in 1786. Returning to Philadelphia, he became Adjunct Professor of Anatomy in 1791, and continued to lecture until his death. His System of Anatomy was issued in parts, 1811–1814, making two volumes, and was a popular text-book for a long time.

The first work issued by Dr. Horner was a Dissector's Manual, in 1823. This was followed by his treatise on General and Special Anatomy in 1826, his Anatomical Atlas, and treatise on General and Special Histology.

A good original work has yet to be written on this last subject, in this country. In surgical anatomy, Drs. Anderson and Darrach have produced partial treatises, the first on the groin, pelvis, and perineum, New York, 1822; the second on the anatomy of the groin, Philadelphia, 1830.

Drs. N. R. Smith, Goddard, and Neill, have each issued a work on the Surgical Anatomy of the Arteries. Among the few original works in this department, should be mentioned those of Dr. John D. Godman, a native of Annapolis, Md., 1794–1830. Poor and almost friendless, but urged on by an unquenchable thirst for knowledge, he persisted in obtaining an education in spite of the greatest difficulties and discouragements, and at last took the degree of M.D. at the University of Maryland in 1818.

In 1821 he went to Cincinnati to accept a chair in the Medical College of Ohio, but dissensions in the faculty induced his speedy resignation. He then established a medical journal hereafter to be alluded to, but in 1822 went to Philadelphia and began a course of private lectures in anatomy. In 1826 he accepted the chair of Anatomy in Rutgers College in New York, but failing health soon compelled him to cease teaching, although he continued to use his pen until just before his death. Dr. Godman was an anatomist by nature, and though the necessities of bread-winning prevented him from accomplishing any great work, his treatise on the fascia[1] and his contributions to physiological and pathological anatomy[2] are really original and valuable productions.

The papers of Dr. John Dean on the "Microscopic Anatomy of the Lumbar Enlargement of the Spinal Cord," Cambridge, 1861, and on "The Gray Substance of the Medulla Oblongata," published by the Smithsonian Institution in 1864, are the results of careful work, and are noteworthy for the use made of photo-lithography from micro-photographs to obtain the illustrations.

The craniological works of Drs. Morton and J. A. Meigs should be referred to here. Dr. Samuel George Morton, 1799–1851, was a native of Philadelphia, and graduated in medicine at the University of Pennsylvania in 1820, after which he continued his studies for three years at Edinburgh, obtaining his degree in 1823. From 1839 to 1843 he was Professor of Anatomy in the Pennsylvania Medical College. His fame rests upon his "Crania Americana," Philadelphia, 1839, and his "Crania Egyptiaca," ibid., 1844; works which have a world-wide reputation, and whose value is permanent. His labours in this direction have been continued by Dr. J. Aitken Meigs, whose "Catalogue of Crania," Philadelphia, 1857, is well known to all who are interested in this subject.

[1] Anatomical Investigations, comprising Descriptions of Various Fasciæ of the Human Body, 8vo., Philadelphia, 1824.

[2] Contributions to Physiological and Pathological Anatomy, 8vo., Philadelphia, 1825.

In physiology, our text-books have been the works of Dunglison, Draper, Dalton, and Flint, all too well known to require more than a mere reference. The work of Professor Draper, published in 1853, was the first in this country in which micro-photographs were used to obtain illustrations. To these may be added the works of Reese, Oliver, Goadby, and Paine. Of special treatises and essays, the most important are Beaumont's Experiments on Digestion, Plattsburgh, 1833; Draper "On the Forces which produce the Organization of Plants," New York, 1844; Joseph Jones' "Investigations," published by the Smithsonian in 1856; S. W. Mitchell's "Researches upon the Venom of the Rattlesnake," *idem*, 1860; and Hammond's "Physiological Memoirs," Philadelphia, 1863. In this department Brown-Séquard may be claimed as an American author; some of his researches having been made, and the results first published in this country. Those who are familiar with the literature of thirty years ago will remember with a smile, the treatise of Emma Willard on the circulation of the blood, and the controversies to which it gave rise. The "Essays on the Secretory and the Excito-Secretory System of Nerves," by Dr. H. F. Campbell of Georgia, Philadelphia, 1857, should be remembered in this connection, as also the pamphlets of Dr. Dowler of New Orleans.

In the department of Materia Medica and Therapeutics, we have made a good record. In Medical Botany, the works of B. S. Barton and Jacob Bigelow deserve especial mention as works of permanent value. The "Illustrations of Medical Botany," edited by Dr. Carson, Philadelphia, 1847, containing one hundred plates, in folio, is a rare and costly work, a considerable part of the edition having been destroyed by fire.

The first systematic treatise on Materia Medica and Therapeutics, produced in this country, was that of Dr. Chapman, Philadelphia, 1817. This was followed by the works of Eberle, J. B. Beck, Dunglison, Harrison, G. B. Wood, T. D. Mitchell, Biddle, Stillé, Riley, and H. C. Wood, all of which have been, or are popular text-books in the schools.

The majority of these authors will be referred to under other sections, but of three, a few words may here be said. Dr. John P. Harrison was born in Louisville in 1796; studied under Dr. Chapman, and graduated in medicine in 1819. He was Professor of Materia Medica in the Cincinnati College from 1836 to 1839. In 1841 he accepted the same chair in the Medical College of Ohio, in 1847 was transferred to that of Theory and Practice, and died of cholera in 1849. He was one of the editors of the Western Journal of Medicine, and of the Western Lancet; published a collection of his essays in 1835, and his "Elements of Materia Medica and Therapeutics" in 1846.

The principal work on Materia Medica is the "United States Dispensatory" of Wood and Bache. Dr. Franklin Bache was born in Philadelphia in 1792, and died in 1864. Graduating as Bachelor of Arts in 1810, he studied under Dr. Rush, and obtained his medical degree in 1814. His tastes led him to the special study of chemistry, of which branch he was appointed professor in the Franklin Institute, in 1826. In 1841 he accepted the same chair in the Jefferson School. His principal work was in connection with the United States Pharmacopœia and the Dispensatory, which have made his name familiar to every physician in the United States. The first proposal to form a Pharmacopœia in this country was made to the College of Physicians of Philadelphia, in 1787, with the result of the appointment of a committee, which seems to have continued

about ten years, but effected nothing. In 1808 a Pharmacopœia was published by the Massachusetts Medical Society, and in 1816 another was issued by the New York Hospital. Our present national Pharmacopœia originated in a plan submitted to the New York County Medical Society, in 1817, by Dr. Lyman Spalding. A leading part in the formation of the first edition, by the convention which met in Washington in 1820 for that purpose, was taken by the College of Physicians of Philadelphia, through its delegates, and more especially by Dr. Thomas T. Hewson; and in the subsequent revisions, Drs. Hewson, Bache, and Wood were the principal workers. The first revision, adopted in 1830, was entirely the production of these gentlemen, and was substantially a new work. The Dispensatory was projected by Drs. Wood and Bache as an exposition of the Pharmacopœia, and a means of making it more popular.

The exposition has, so far as our physicians are concerned, entirely overshadowed the text, and in a financial point of view, the Dispensatory is the most successful medical book ever published in this country.

Among writers on Materia Medica, distinguished in their day, may be mentioned Dr. William Tully, 1785–1859, who graduated at Yale in 1806, and attended medical lectures at Dartmouth College in 1808–9. He received the honorary degree of M.D. from Yale in 1819. In 1824, he was appointed Professor of Theory and Practice in the Castleton School, and in 1826 removed to Albany, forming a partnership with Dr. Alden March. In 1829, he accepted the chair of Materia Medica and Therapeutics at Yale, and removed to New Haven, but continued his lectures in Castleton until 1838. He ceased teaching in 1841. His principal works were the "Essays on Fevers," published with those of Dr. Miner 1823, a work which gave rise to much controversy, and was, upon the whole, not favourably received; a prize essay upon Sanguinaria, published in the American Medical Recorder in 1828; some papers in the Boston Medical Journal; and finally, his treatise entitled "Materia Medica, or Pharmacology and Therapeutics," Springfield, 1857–58, in two large volumes 8vo. This was published in numbers, was not a popular work, nor calculated for the use of a student, but shows great industry and learning in every page. Complete copies of it are not now easily obtained, although it cannot be said to be rare. His style is discursive, diffuse, and polysyllabic, and a decided effort is necessary to peruse his writings; but his knowledge of facts was minute and exact, and his last work is a mine of information, which is even now worth exploring by the curious.

In Surgery, our indigenous text-books have been produced by Dorsey, Gibson, S. D. Gross, Ashhurst, and Hamilton. On Operative Surgery we have the treatises of Pancoast, Piper, H. H. Smith, Stephen Smith, and Packard. The posthumous work of McClellan is not a systematic treatise, but a series of essays and cases, in which the description of Shock is especially noteworthy as being true to life. Of monographs, the most valuable are those by Professor Gross, on Wounds of the Intestines, 1838; on Diseases of the Bladder, 1851–55; on Foreign Bodies in the Air-passages, 1854 and 1862; and Diseases of the Bones and Joints, 1830; F. H. Hamilton on Fractures and Dislocations, 1860, fifth edition, 1875; Durkee and Bumstead on Venereal; Van Buren and Keyes, and Gouley on the Urinary Organs; Bushe on Diseases of the Rectum; Carnochan on Congenital Dislocations of the Head of the Femur; H. J. Bigelow on the Mechanism of Dislocation and Fracture

of the Hip; Ashhurst on Injuries of the Spine; Markoe on Diseases of the Bones; and Garretson's Oral Surgery. Specially valuable collections of cases, are the works of John C. Warren, on Tumors, Boston, 1837; and of J. Mason Warren; the pamphlets of Sayre on Orthopædic Surgery; N. R. Smith on Fractures of the Lower Extremity; and J. C. Nott, "Contributions to Bone and Nerve Surgery." As an example of careful statistical work, the treatise of R. M. Hodges on "The Excision of Joints," Boston, 1861, is to be specially commended.

The treatise of Dr. Gross, on Wounds of the Intestines, above referred to, first appeared in the "Western Journal of Medicine;" it contains the results of numerous experiments and observations, and is of much practical value and interest. It is a rare book, and a copy of it may properly be considered a prize by the collector.

In Military Medicine and Surgery nothing of value was produced by the revolutionary war, the war of 1812, or the war with Mexico. This deficiency has been, to a great extent, made up by the number and value of works resulting from our late war.

The Medical and Surgical History of the War will be, when completed, the largest medical work ever produced in this country. The publications of the Sanitary Commission, including the works of Flint, Gould, and Lidell, contain valuable data. The manuals of military surgery have been written by Gross, Hamilton, Tripler, Blackman, Chisholm, and Warren. Other works which should be remembered in this connection are, Woodward on Camp Diseases, the statistical reports and circulars issued from the Surgeon General's Office, and the medical statistics of the Provost-Marshal General's Office, compiled by Dr. Baxter, making two handsome quarto volumes, which are a most valuable addition to our knowledge of anthropometry and medical topography.

In the departments of Theory and Practice of Medicine, we have produced a fair amount of monographs and text-books, the most important of the latter class being those of Chapman, Eberle, G. B. Wood, and Flint. The following is a brief outline of the lives of a few who were our principal writers and teachers in this branch of medicine, but who now rest from their labours. Among them, there are few, who, in their day, had a more extended reputation, or were more popular than Dr. Nathaniel Chapman.

Born in Virginia in 1780, he received an excellent general education, became a pupil of Dr. Rush, with whom he was a favourite, graduated at the University in 1800, then spent three years in Europe, one as a pupil of Abernethy, and two at Edinburgh, and in 1813 was elected to the chair of Materia Medica in his Alma Mater, to be exchanged in 1816 for that of the Theory and Practice of Medicine, which he held until 1850, when he resigned. He died in 1853. His "Therapeutics and Materia Medica," published in 1817, was the best work of the kind in English at that date. He was the first President of the American Medical Association after its permanent organization; President of the American Philosophical Society, a popular lecturer, a genial companion, and in his prime probably the most distinguished physician in the United States. He edited, for seven years, the Philadelphia Journal of the Medical and Physical Sciences. Many of his lectures were published in the "Medical Examiner," in 1838–40. Two volumes of these

lectures were published in 1844, and a compendium of his course on theory and practice was issued in 1846.

Contemporary with Dr. Chapman, and for twenty-five years associated with him as a teacher, was Dr. Samuel Jackson, 1787–1872, a native of Philadelphia, and educated in the University of Pennsylvania, having graduated in medicine in 1808. From 1825 to 1863, he was Professor of the Institutes of Medicine in his Alma Mater. His "Principles of Medicine" (Philadelphia, 1832, 8vo.) was a treatise on pathology, founded on the doctrines of Broussais, and received high praise in its day. It was also the subject of a long and acrimonious critical review by Dr. Caldwell. The popular story that Dr. Jackson recalled all the copies of this work that he could is incorrect; the entire edition was sold in the usual manner, and the publishers desired to issue another, but the author refused, on the ground that the science was undergoing such rapid and great changes that he would feel it necessary to re-write the entire work, a labour which his health and the demands of his private practice would not allow him to undertake. His most important writings are contained in the American Journal of the Medical Sciences, the last being a paper on a rare disease of the joints, in the July Number for 1870.

Dr. John Eberle, 1788–1838, was of German descent, and a native of Pennsylvania. After graduating in medicine in 1809, he went into politics, edited a newspaper, acquired intemperate habits, and became a bankrupt. Commencing life again, in 1825 he took the chair of Theory and Practice in the Jefferson School, which he held until 1831, when he removed to Cincinnati, and became connected with the Faculty of the Medical College of Ohio. In 1837, he removed to Lexington, Ky., to accept a chair in the Transylvania School, but could not lecture, and soon died. His treatise on the Practice of Medicine, first published in 1829, was, in its day, a very popular work, in part at least because of the formulæ which it contained, but is now forgotten.

Dr. Elisha Bartlett, born in Rhode Island in 1804, died 1855, graduated in medicine at Brown University in 1826, after which he spent a year in Paris. He held Professorships at Woodstock, Vt., Pittsfield, Mass., Dartmouth, Baltimore, Lexington, Louisville, and finally, in 1850, in the University of the City of New York. Of the numerous productions of his pen, the most noteworthy are the "Inquiry into the Degree of Certainty in Medicine," etc., Philadelphia, 1848; "The History, Diagnosis, and Treatment of Typhoid and Typhus Fever," Philadelphia, 1842; and, "The History, Diagnosis, and Treatment of the Fevers of the United States," Philadelphia, 1847; of which, three subsequent editions were issued. To these may be added his essay on the Philosophy of Medical Science, in which the importance of facts and observations is insisted on, and all theorizing is denounced, in accordance with the teachings of Louis.

Dr. David Hosack, 1769–1835, a native of New York, graduated as Bachelor of Arts at Princeton in 1789, and as Doctor of Medicine in the University of Pennsylvania in 1791. After practising a year at Alexandria, Va., he spent two years in Edinburgh and London. Returning to New York, he entered into partnership with Dr. Samuel Bard, was appointed Professor of Botany in Columbia College in 1795, to which was added the chair of Materia Medica, in 1797. In 1807, he was chosen Professor of Surgery and Midwifery in the newly-formed

College of Physicians and Surgeons of the State of New York, and in 1813, took the chair of Theory and Practice. In 1826, he resigned, with others, and went into the Rutgers Medical College. His writings appear in the philosophical transactions, in the "Medical and Philosophical Register," of which he was the founder, and as occasional lectures and pamphlets. They were collected and published as "Essays on various subjects in Medical Science," in three volumes, New York, 1824–1830. His "System of Nosology" reached two editions; his "Lectures on Theory and Practice" were edited by Dr. Ducachet, and published at Philadelphia in 1838. His most important paper was his "Observations on Febrile Contagion," and on the means of improving the Medical Police of the City of New York, N. Y., 1820. As a lecturer, editor, and writer, he exercised much influence on the profession, and his literary and scholarly tastes were imparted to his pupils, and especially to Dr. John W. Francis, who, after his graduation in 1810, became associated with him in practice. Dr. Francis was the son of a German grocer, born in New York, 1789, died 1861. He was for thirteen years Professor in the College of Physicians and Surgeons, and followed Dr. Hosack to Rutgers, the close of which ended his career as a teacher.

Dr. Joseph Mather Smith, 1789–1866, graduated at the College of Physicians and Surgeons in 1815, and was Professor of Theory and Practice of Physic, same school, 1826 to 1855, when he took the chair of Materia Medica. He contributed largely to literature through the medical journals; presented some interesting reports to the American Medical Association, and published "Elements of Etiology," a "Philosophy of Epidemics," New York, 223 pages 8vo.

For beauty of style as a writer and lecturer, Dr. Samuel Henry Dickson is pre-eminent. Born in Charleston in 1798, he graduated at Yale in 1814, and in Medicine at the University of Pennsylvania in 1819; was Professor in the Charleston Medical School from 1824 to 1831, 1833–34, 1850–7; in the New York University, 1847–50; and in the Jefferson School, 1858; he died March 31, 1872. His systematic works were not very successful, or worthy of special remark, but his journal contributions, and especially his volumes of essays, are among the most attractive literature of medicine.

John K. Mitchell, born in Virginia, 1793, took his academical degrees at the University of Edinburgh, commenced his medical studies under Dr. Chapman in 1816, and graduated in medicine at the University of Pennsylvania in 1819. After three voyages to India and China, for the sake of his health, he returned to Philadelphia, and in 1822, began to deliver lectures on Medical Chemistry in the Summer School. In 1841, he was elected to the chair of the Practice of Medicine in the Jefferson Medical College, which he filled to the date of his death in 1858. As an original investigator, and clear logical reasoner, his name stands among the highest, and is probably destined to a higher relative position in the future, than it enjoys even now. His papers on Endosmosis, Mesmerism, Ligature of Limbs for Spasm, and Cryptogamous Origin of Fevers, will be consulted, not only for the original facts which they set forth, but as models of suggestiveness, if the phrase may be permitted.

Dr. Charles Frick, born at Baltimore August 8, 1823, received the degree of Doctor of Medicine from the University of Maryland in 1845.

In 1856, he was chosen to the chair of Materia Medica in the Maryland College of Pharmacy, and in 1858, he became Professor of Materia Medica and Therapeutics in the University of Maryland. His most valuable contributions to literature are his "Analysis of the Blood," American Journal of the Medical Sciences, January, 1848; "Treatise on Renal Diseases," 1850; "On Diabetes," American Journal of the Medical Sciences, 1852; "On Urinary Calculi," American Medical Monthly, April, 1858. He died March 25, 1860, of Diphtheria, contracted from a patient upon whom he had performed the operation of Tracheotomy five days previous. All his papers are careful, conscientious reports of original observations, with the least possible amount of theory, and with direct reference to practice.

Among the diseases which have received the greatest amount of attention in this country may be mentioned yellow and malarial fevers, and diseases of the chest. Our literature on yellow fever includes over one hundred books and pamphlets, besides more than six hundred journal articles. It was the epidemic of this disease along the North Atlantic coast which gave the first impetus to medical authorship in this country, and produced a mass of controversial writings which, although of little value in a scientific point of view, were useful, as giving their authors the habit of writing for the press. The earlier books have already been referred to, but mention should be made of the writings of Felix Pascalis *Ouviere*, generally known under the name of Pascalis. Dr. Pascalis was a native of Provence, France, and was born about 1750. Having graduated in medicine at Montpellier, he went to St. Domingo, and there practised his profession until driven out by the Revolution of 1793, when he came to Philadelphia, and subsequently settled in New York, where he died in 1833. Besides his works on Yellow Fever, he wrote a treatise on Syphilis, New York, 1812, and contributed papers to journals. He was one of the editors of the Medical Repository.

Another writer on Yellow Fever who seems to be little known except in the South is Dr. J. L. E. W. Shecut, a native of South Carolina, born in Beaufort, 1770; died in Charleston, 1836. He studied under Dr. Ramsay, of Charleston, graduated M.D. at Philadelphia in 1791, and at once commenced practice in Charleston.[1] His most important essays were collected and published in one volume, Charleston, 1819, under the title of "Shecut's Medical and Philosophical Essays." This book, which is quite rare, contains his account of the yellow fever of 1817, first published in that year, and also his "Essays on Contagions and Infections," first published in 1818, and should be consulted by those who wish to trace the history of opinions in the South relating to this disease.

The principal work on Yellow Fever, which includes the information of all others of a prior date, is that of Dr. Réne la Roche, published in 1855. Dr. La Roche was of French descent, born in Philadelphia, in 1795, his father being an emigrant from St. Domingo. Unlike the majority of prominent American physicians, he was not connected with a large medical school, and his justly deserved reputation rests entirely upon his writings, and especially on his treatise on Yellow Fever, which is a model of research, and is remarkable, not only for the number, but the accuracy of its references, and the impartiality with which opposing statements are given.

[1] For these data I am indebted to Dr. Robert Lebby, of Charleston.

The most valuable recent articles on this disease are in the New Orleans and the Charleston Medical Journals, but the great majority of them are historical and controversial.

During the course of an epidemic, physicians are too busy to make observations which require much time or care, or to make more than brief notes. The papers of Drs. Faget,[1] Logan,[2] and Sternberg,[3] giving temperature observations, make an advance in the right direction, but we lack data as to the pathological chemistry of the disease, and as to its relations with the malarial fevers. With regard to this last class of diseases, our literature is even more extensive than that of the preceding, and occupies much space in the journals of the West and South.

Our most valuable contribution to the natural history of malarial disease is the treatise of Dr. Daniel Drake, on the principal diseases of the Interior Valley of North America. This work is the "Magnum Opus," and results of the life-long labour, including extensive personal observations, literary research, and matured reflection, of a man whose fame, as compared with that of his contemporaries, will probably be greater a century hence than it is to-day, and whose name, even now, should be among the first on the list of the illustrious dead of the medical profession of the United States. The son of an illiterate Kentucky pioneer, brought up in a log cabin, attending a country school in the winter, and using the remainder of the year working on a farm, he surmounted the obstacles thus placed in his way, and by unceasing labour, joined to a sound common sense, which rose to the level of genius, took a leading position as author, editor, practitioner, and teacher. Commencing the study of medicine at the age of sixteen, he attended his first course of lectures in 1805, and his second in the University of Pennsylvania, in 1815, at the end of which he graduated. He was Professor successively in the Transylvania School, the Medical College of Ohio; a second time in the Transylvania; the Jefferson School; the Medical Department of Cincinnati College; the University at Louisville; and again in the Medical College of Ohio. He died November 6, 1852. His first publication was a pamphlet on the climate and diseases of Cincinnati, published in 1810, and reissued as "The Natural and Statistical View or Picture of Cincinnati and the Miami Country," published in 1815. This work is quite rare, and is interesting as being the germ from which sprung his great work above referred to.

He founded the "Western Journal of the Medical and Physical Sciences," which would be of much value, if for no other reason, on account of a series of essays on Medical Education, by Dr. Drake, which were published in it. These essays were issued in a separate volume, in 1832, and form, upon the whole, the most satisfactory contribution to this vexed question which this country has ever produced. He commenced the preparation of his work on the diseases of the Mississippi Valley in 1822, and the second volume was not issued until after his death. Very few of the younger physicians of this country are familiar with his writings. Of his essays on Medical Education and Diseases of North America, no second editions have been published; but if there are any books to which the hackneyed phrase of the reviewer, "No physician's library is complete without it," apply, it is to these works of

[1] New Orleans Med. and Surg. Journal, 1873, i., N. S., p. 145.
[2] Do. do. 1874, ii. p. 779.
[3] Amer. Jour. Medical Sciences, 1875, lxx. p. 99.

Dr. Drake, as far as American physicians are concerned, and they are most distinctively and peculiarly American books, in subject, mode of treatment, and style of composition.

The dissertation of Dr. J. K. Mitchell "On the Cryptogamous Origin of Malarious and Epidemic Fevers," is an ingenious piece of reasoning, and presents a summary of all the *à priori* arguments in favor of this theory which can be advanced. The papers of Dr. Salisbury on the same subject are without value.

Upon the subject of diseases of the chest the most noteworthy monographs have been the works of Morton, McDowell, Lawson, and Flint on Consumption; of Horace Green on the Diseases of the Air-passages; La Roche on Pneumonia, and of Gerhard and Flint on Diagnosis of Diseases of the Chest. The treatise on Phthisis, by Dr. L. M. Lawson, adds another to the numerous examples of careful studies by physicians of diseases with which they are themselves afflicted. Dr. Lawson was a native of Kentucky; born 1812, died 1864. His early education was defective. At the age of twenty he was licensed to practise, but it was not until 1838 that he obtained his diploma from the Transylvania School. In 1844 he was elected to a Professorship at Lexington; from 1847 to 1853 he filled the chair of Materia Medica in the Medical College of Ohio, and then became Professor of Principles and Practice of Medicine. During the winter of 1859–60, he lectured on Clinical Medicine in the University of New Orleans. He founded, and for a long time conducted, the "Western Lancet," in which many of his lectures were published.

Dr. W. W. Gerhard, 1809–72, was a native of Philadelphia, and a graduate of the University of Pennsylvania. After taking his degree he spent two years in Paris, and became thoroughly indoctrinated with the teachings of Louis. On his return to Philadelphia he was appointed lecturer at the Medical Institute, and Assistant Clinical Lecturer to Professor Jackson. For twenty-five years he was the senior Physician to the Pennsylvania Hospital. Some of his clinical lectures appeared in the "Medical Examiner," of which he was one of the editors. His principal work was his "Treatise on Diagnosis of Diseases of the Chest," Philadelphia, 1842; second edition, 1846.

Dr. Horace Green, 1802–1866, was a native of Vermont, and a graduate of Castleton Medical College in 1824. From 1840 to 1843 he was Professor of Theory and Practice in the same school; and in 1850 took the same chair in the New York Medical College, of which he was one of the founders, continuing to lecture until 1860. In connection with this school he established, with his colleagues, the "American Medical Monthly." He was the first in this country to devote himself to a specialty, and his works on the local treatment of diseases of the air-passages attracted much attention, although they are not of a character to add permanently to his fame.

In medical jurisprudence, the systematic works of Beck, and Wharton and Stillé, and the treatise of Dr. Wormley on Poisons, are the most important, and each of them compares most favourably with any similar works in existence.

There are probably not to be found in the annals of medicine so large and valuable contributions to its literature by three brothers, as were made by the Beck family of New York.

John B. Beck, 1794–1851, graduated in Columbian College in 1813, became a pupil of Dr. Hosack, and graduated in Medicine at the

College of Physicians and Surgeons in 1817, presenting, as a thesis, a paper on Infanticide, which was published, and is still a standard work on this subject. In 1822 he assisted in establishing the "New York Medical and Physical Journal," with which he was connected for the next seven years, and in which he published numerous articles. In 1826 he became Professor of Materia Medica in the College of Physicians and Surgeons, just newly organized. His principal works, in addition to those already alluded to, were his "Essays on Infant Therapeutics," New York, 1849; second edition, 1855; and his Historical Sketch of the State of Medicine in the American Colonies; "Lectures on Materia Medica," and a collection entitled, "Researches in Medicine and Medical Jurisprudence."

Theodoric Romeyn Beck, 1791–1855, graduated at Union College, Schenectady, studied under Dr. Hosack, and graduated as M.D. at the College of Physicians and Surgeons, in 1811. He was appointed Professor of the Institutes of Medicine and Medical Jurisprudence in the College at Fairfield, in 1815. In 1817 he became Principal in the Albany Academy, and gave up the practice of medicine. In 1840 he took the chair of Materia Medica in the Albany Medical College, which he held until 1854. His great work was his treatise on Medical Jurisprudence, which appeared in 1823, in two volumes, and of which, including four English editions, ten editions were issued during the author's life.

Dr. Lewis C. Beck, 1798–1853, the younger brother of the preceding, studied medicine under Dr. Dunlop, and was admitted to practice in 1818. In 1826 he was elected Professor of Botany and Chemistry in the Vermont Academy of Medicine. This position he resigned in 1832. In 1836 he was appointed Mineralogist to the Geological Survey of the State of New York, and in 1840 was elected Professor of Chemistry and Pharmacy in Albany Medical College. His contributions to medical literature, to chemistry, meteorology, and mineralogy, were numerous. His principal medical work was his Report on Cholera, made to the Governor of New York in 1832.

The literature of obstetrics has been so fully given by Dr. Thomas, in a preceding article of this series, that further reference to it is superfluous. We will add only, with regard to Dr. Hugh L. Hodge, that he was a graduate of Princeton, a pupil of Dr. Wistar, and that his early taste was for surgery rather than obstetrics. He was induced to change his specialty by Dr. Dewees. He was afflicted with defective vision, which increased with age, and his great work on Obstetrics was produced entirely by dictation. He commenced as a lecturer in the Medical Institute, and was elected Professor of Obstetrics in the University of Pennsylvania in 1835, the rival candidate being Dr. Charles D. Meigs, a lecturer in the Philadelphia Association for Medical Instruction, who six years later obtained the chair of Obstetrics in the Jefferson School. The literary works of Dr. Meigs compare very unfavourably with those of his rival as to scientific value and exactness, but they are much more attractive to students and those who read for pleasure rather than instruction.

We have three names of American medical writers whose works should be mentioned here, viz., Coxe, Watson, and Dunglison.

Dr. John Redman Coxe, 1773–1864, was a type of the medical scholar, who loves books for their own sake, and who takes more pleasure in discovering a forgotten sentence in a folio of the fifteenth century

than in original investigations in the light of the present day. Born in Trenton, New Jersey, he completed his classical education at Edinburgh, studied medicine under Dr. Rush, and took his degree of M.D. at the University of Pennsylvania in 1794, after which he continued his medical studies in London, Edinburgh, and Paris for about two years. He was elected Professor of Chemistry in the University of Pennsylvania in 1809, and of Materia Medica and Pharmacy in 1818. He filled the latter chair until 1835, at which date he retired, and was but little known thereafter. His Dispensatory[1] and Medical Dictionary[2] were useful compilations, and met an existing want. His Observations on Vaccination[3] was his best original contribution to medicine. His Inquiry on the Discovery of the Circulation of the Blood was a paradoxical attempt to disprove the claims of Harvey. His last work, and the one most in accordance with his tastes, was "The Writings of Hippocrates and Galen," Philadelphia, 1846. He founded the first medical journal published at Philadelphia, preceding that published by Dr. Benj. Smith Barton by two months, and his library was, in its day, the best collection of ancient authors on medicine in this country.

Dr. John Watson, of New York, has been alluded to in the article on surgery. His literary tastes led him to historical studies and the collection of a valuable library, and his historical sketch of ancient medicine[4] shows that he consulted and enjoyed consulting the original works of the fathers in medicine.

Dr. Robley Dunglison, a native of Keswick, England, born in 1798, was one of the most prolific of medical authors. He obtained his medical education at Edinburgh, Paris, and London; settled in the latter city, where he wrote a treatise on the diseases of children [1824], and was one of the editors of the London Medical Repository in 1823–24. In 1824 he accepted the invitation of Thomas Jefferson to fill the chair of Anatomy, Physiology, Materia Medica, and Pharmacy, in the University of Virginia. At this place he published in 1827 a syllabus of his course on Medical Jurisprudence and prepared his Medical Dictionary. In 1833 he took the chairs of Materia Medica, Therapeutics, Hygiene, and Medical Jurisprudence in the University of Maryland, and from 1836 to 1868 was Professor of the Institutes of Medicine in the Jefferson School. He died April 1, 1869. His Systems of Physiology (first edition 1832), Hygiene (first edition 1835), Therapeutics (1836), Practice (1842), and Materia Medica (1843), were popular in their day, nearly all of them passing through several editions. The work by which he will be remembered is his Medical Dictionary. The first edition of this was published at Boston in 1833, in two volumes. A peculiarity of this edition is that it contains brief biographical sketches of physicians, omitted in subsequent issues. The last edition, Philadelphia, 1874, edited by his son, is the most convenient work of the kind in existence.

Our literature on insanity and the pathology of mental disease is insignificant in comparison with the importance of the subject and the opportunities existing for its study, the only monograph of permanent value being the "Contributions to Mental Pathology," by Dr. Isaac Ray, 8vo., Boston, 1873. Considering the number and size of the

[1] The American Dispensatory. Phila., 1806, 4th ed. 1818.
[2] The Philadelphia Medical Dictionary. Phila., 1808, 2d ed. 1817.
[3] Practical Observations on Vaccination. Phila., 1802.
[4] The Medical Profession in Ancient Times. 8vo., N. Y., 1856.

asylums for the insane in this country, and the amount of money which has been spent upon them, it is rather curious that the medical officers connected with them should have contributed so little to the diagnosis, pathology, or therapeutics of diseases of the nervous system. An examination of the works relating to this subject, and more especially of the American Journal of Insanity, which is the most important, and which contains the transactions of the Association of American Superintendents of Hospitals for the Insane, will show that the thoughts of these specialists have been mainly directed to the subjects of construction and management of asylums and to the jurisprudence of insanity. This last subject is one of great and increasing importance; but our contributions to its literature consist rather of opinions and ontological speculations than of scientific observations. The annual reports of our insane asylums consist, for the most part, of business and financial statistics, and are intended for the use of appropriation committees rather than of physicians. There are some signs, however, that more attention will hereafter be given to recording of the physical phenomena of mental disease, and it is to be hoped that we may soon have some published results from the pathological department of the Utica Asylum, which will stimulate other institutions to undertake similar work. No more promising field to-day exists in medical science for valuable discoveries than in the wards and laboratory of a large, well-appointed hospital for the insane.

Upon the subject of hygiene no systematic work has yet been produced in this country, with exception of the treatise on Military Hygiene, by Dr. Hammond. One of the principal writers in this department was Dr. John Bell, a native of Ireland, 1796–1875. He came to this country with his parents, who settled in Virginia in 1810, and graduated in medicine in the University of Pennsylvania, after which he lectured for some years in the Philadelphia Medical Institute, and for two years in the Medical College of Ohio. His treatise on Baths and Mineral Waters is the only comprehensive and respectable treatise on this subject published in this country. The most important contributions to the literature of hygiene which we have produced are the reports of the various State and municipal boards of health, most of which, however, are of comparatively recent origin, and it is to be hoped are only just fairly commencing their career of usefulness.

The subject of hospital construction and hospital hygiene has been much discussed in this country, the latest production being a large and handsomely illustrated work published by the trustees of the Johns Hopkins Hospital of Baltimore.

The publications of our municipal, State, and national governments, relating to vital and medical statistics, are among our most valuable contributions to medical literature. The reports of city and State boards of health show each year evidences of more careful investigation into the probable causes of disease and the means of removing or diminishing them, and the necessity and economic value of such work is slowly but steadily becoming apparent to the educated classes of the community by means of the publications referred to.

The circulars and reports of the medical department of the army are sufficiently well known, and within the last few years a series of reports have been commenced by the Medical Department of the Navy and by the Marine Hospital Service of the Treasury Department, which it is to be hoped will become important additions to our medical literature, not

only in regard to statistics, but in the departments of hygiene, pathology, and therapeutics. It should not be forgotten by the physicians of the United States that they are, to a certain extent, responsible for the condition of the medical departments of the government, since the sympathy and opinions, expressed or implied, of the medical profession at large as to the work which these departments have done, or are trying to do, furnish the encouragement and stimulus which are necessary to the continuous production of good results, and also influence to a considerable extent the action of our legislators with regard to the officers of these departments.

The reports of the Surgeon-Generals of the Army, the Navy, and the Marine Hospital Service, while ostensibly presented to the Secretaries of War, the Navy, and the Treasury, are really, in a sense, made to the physicians of the country, who are the only competent judges as to whether the work is satisfactory, and commensurate with the means which have been allowed for its performance.

Of encyclopedic works, the result of the combined labour of many authors, like the great French dictionaries, but one specimen has been attempted in this country. This was the American Cyclopædia of Practical Medicine and Surgery, edited by Dr. Isaac Hays, of which two volumes, completing the letter "A" were published at Philadelphia in 1834–36, and reissued with a new title, "Medical and Surgical Essays," in 1841. The time is perhaps not far distant when a first-class publication of this character will be sufficiently in request in this country to warrant an attempt at its production.

Reprints and Translations.—The second class of medical works referred to in our statistics, includes the reprints and translations, which cannot be overlooked in an account of our medical literature, since they have formed an important part of the libraries of American physicians, even if quantity only be considered.

Prior to the Declaration of Independence, the largest and most important medical book printed in this country was the "Lectures on Materia Medica," of Cullen, issued at Philadelphia in 1775, in 4to., and advertised as "The very cream of physic," and as "absolutely necessary for all American physicians who wish to arrive at the top of their profession."[1]

In 1776 was published, at Philadelphia, the treatise of Van Swieten on the Diseases Incident to Armies, with Ranby on Gunshot Wounds, and Northcote on Naval Surgery, forming a small volume of 164 pages, which is usually found bound with the second edition of John Jones' "Practical Remarks," etc., of the same date, and was probably the principal guide of the army surgeons during the Revolutionary War. Cullen's "First Lines of the Practice of Physic"[1] was reprinted from a smuggled copy, in 1781, at Philadelphia, in two volumes, 8vo., and five later American editions, the last edited, with a great flourish of trumpets, by Dr. Caldwell, in 1822, attest its popularity.

For thirty years after the Declaration of Independence, the majority of the reprints were works of English and Scotch writers, and especially of the Edinburgh school, the favourite authors being Cullen, Brown, John Hunter, Benjamin Bell, Denman, Smellie, Hamilton, Beddoes, and

[1] A copy of this work was purchased by the Library of the Pennsylvania Hospital 1780, for £135 5*s.* currency, equal to £1 15*s.* specie.

Robert Jackson. The largest edition sold was probably of the "Edinburgh New Dispensatory." The only translations of French or German medical works issued in this country prior to 1800 were, Swediaur on Venereal, New York, 1788, and Blumenbach's "Elements of Physiology," Philadelphia, 1795. The first medical book printed in Louisiana was "Médicaments et précis de la Methode de M. Masdevall," a pamphlet of 48 pages, relating to the yellow fever, issued in 1796.

The beginning of the influence of the French schools, which for the next fifty years was so powerful in the United States, especially in surgery, is marked by the editions of Boyer and Desault, Philadelphia, 1805, to which rapidly succeeded the works of Alibert, Richerand, and Bichat. In this connection may be permitted a reference to two works which are omitted from our statistics, since they were intended for non-professional use, but which had an extensive sale, and indirectly exerted a very considerable influence, viz., Buchan's Domestic Medicine, of which several editions were issued, the most important being that of Philadelphia, 1795, revised by Dr. S. P. Griffitts, and the "Primitive Physic," of John Wesley, of which there are several American editions of the last century.

Many foreign medical works have been issued in this country in connection with periodicals, such as the "Register and Library of Medical and Chirurgical Science," published at Washington, D. C., 1833–36, in which were issued "Bell on the Nerves," "Lawrence on the Eye," Velpeau's Surgery, etc.; The Select Medical Library, edited by John Bell; the American Medical Library, published under the supervision of Dr. Dunglison; and the "Medical News and Library," in which some valuable books have been issued.

The number of translations of French medical works which have been published in this country is one hundred and forty-eight (148). One hundred and one of these were issued prior to 1842, and only eight have appeared within the last ten (10) years.

The number of translations of German works issued has been sixty-four (64), of which but fourteen (14) were issued prior to 1842, and twenty-eight (28) within the last ten years.

The number of reprints of English medical books has been five hundred and eighty-four (584), thirty (30) of these were issued prior to 1800; two hundred and seventeen (217) during the next forty years, and three hundred and thirty-seven (337) since 1840, the production gradually increasing.

It is largely to French and German sources that we owe our works on pathology, pathological anatomy, pathological chemistry, and physiology.

The best systematic treatise on the practice of medicine from the German, published in this country, was that of Niemeyer, in 1869, the name of the author having been made somewhat familiar to the American public by a translation of his lectures on Phthisis, published the year previous. The works of Billroth on General Surgical Pathology, New York, 1871, Rindfleisch, a Text-book of Pathological Histology, Philadelphia, 1872, are the books which are to-day directing the work of the younger professional men of the country. The Cyclopædia of the Practice of Medicine, edited by Ziemssen, now in course of publication, is the most extensive medical work, native or foreign, which has ever been issued in the United States, and is probably destined to exercise great influence upon our investigation of diseases, whatever it may do for the practice.

Of the translations from the French, the most important have been those relating to anatomy, physiology, and surgery. The favourite authors have been Bichat, D. J. Larrey, Boyer, Orfila, Magendie, Laennec, Cazenave, Baudelocque, Louis, Velpeau, Broussais, Cazeaux, Colombat, Ricord, Vidal, and Malgaigne.

It would be useless to give lists of the titles of these; it is sufficient to say that they include nearly every important monograph or text-book produced by English writers: from Cullen, Brown, and Darwin, to Bennett, Watson, and Aitken; from John Hunter, Benjamin, John and Charles Bell, Pott, Hey, and the Coopers, to Erichsen, Paget, and Holmes; and from Hamilton and Smellie to Simpson, Barnes, and Duncan. The works of nearly all the great English teachers have been quickly reproduced on this side of the water, and their modes of treatment are those followed by the majority of our practitioners.

A few medical books have been printed in Spanish at Philadelphia, for the Mexican trade, including the "Compendio de la Medecina," by J. M. Venegas, 1827. The number of reprints in this country has been largely due to the want of an international copyright law, for which reason publishers found it much cheaper to take the work of an English author gratis, than to pay an American writer for his MS. Sometimes the name of an American physician is given as editor of the reprint, but in most cases, this means little more than that he approves the book, the so-called editing being imperceptible. To this remark a few honourable exceptions should be made, such as the additions by John Bell to the lectures of Stokes, of Gerhard to Graves; the reprints of Copland's Dictionary, in which the bibliographical additions, made by Dr. Charles A. Lee, are numerous and valuable, the editions of Velpeau's Surgery by Mott and Blackman, and the editions of Aitken's Practice by Dr. Clymer, who has added much to the completeness of the work.

This so-called editing was the subject of some caustic criticism, and has of late years almost entirely disappeared. With regard to the merits of the International Copyright question, there has been much discussion. On the one side, it is truly said that the desire for books increases by the supply, and that the sale of the cheap reprints produces a market for indigenous productions. On the other side, it is affirmed with equal truth, that it deprives our own writers, to a great extent, of pecuniary inducements to labor. The question is one to be decided, however, by the laws of morality rather than expediency, and the majority of educated non-interested parties agree that the passage of an international copyright law would be an act in accordance with the dictates of common honesty and justice.

Undoubtedly, the cheapness and abundance of these republications have done much to diffuse knowledge among our practitioners, and the libraries of many physicians have been mainly composed of the "pepper and salt sheepskin covered Philadelphia reprints." Of late years there has been a marked improvement in the quality of paper and typography of our medical books, while the stout bindings of sheep and calf of fifty years ago, have been largely superseded by the more showy, but, at the same time, more flimsy cloth bindings now in vogue. The German fashion of publication in parts has been almost unknown, except as connected with periodicals, and it is to be hoped that it may be long before the annoyance and confusion which attends the Lieferung and Hefte may be connected with our medical publications. "The American Clinical Lectures," edited by E. C. Seguin, and published by G. P.

Putnam & Sons, look in this direction most unpromisingly, and the publication of such totally unconnected papers, in a series of continuous paging, even if special paging is added, must be unhesitatingly condemned by all who have occasion to either make or to verify bibliographical references to them.

It may be of interest to refer to some statistics of the locality of publication of these works. Of class one (I) we find that three hundred and seventy-three (373) first editions were published in Philadelphia, one hundred and seventy-three (173) in New York, eighty-one (81) in Boston, twenty-four (24) in Cincinnati, sixteen (16) in New Orleans, and fifteen (15) in Baltimore, leaving ninety-six (96) published elsewhere. If each edition be reckoned as a separate work, we find that six hundred and thirteen (613) have appeared in Philadelphia, two hundred and twenty-six (226) in New York, ninety-six (96) in Boston, and eighteen (18) in Baltimore. Of the reprints and translations, six hundred and eighteen (618) books, or seven hundred and fifty-three (753) editions have been issued from Philadelphia, one hundred and seventy-seven (177) books, or two hundred and nineteen (219) editions from New York, eighty (80) from Boston, and ninety-four (94) elsewhere. It appears then that more than one-half of our medical books have been published in Philadelphia, and about one-fifth in New York. The firm of Carey, Lea & Carey, now H. C. Lea, has published nearly six hundred editions of medical works; and those of Lindsay & Blakiston, and Lippincott, each between one and two hundred. In New York, the principal publishing house is that of S. S. & W. Wood, now Wm. Wood & Co., which has issued about one hundred and fifty (150) editions.[1]

Medical Journals.—It is not in text-books or systematic treatises on special subjects that the greater part of the original contributions to the literature of medicine have been first made public during the last century, either in this or other countries. Since the year 1800 medical journalism has become the principal means of recording and communicating the observations and ideas of those engaged in the practice of medicine, and has exercised a strong influence for the advancement of medical science and education.

To this class of literature this country has contributed a noteworthy share. Excluding those devoted to dentistry, pharmacy, popular hygiene, and "isms" of various kinds, we find that one hundred and ninety-five medical journals have been commenced in this country, including reprints of foreign journals, making in all one thousand six hundred and thirty-seven volumes, or a greater bulk than the text-books and monographs.

Prior to the establishment of medical periodicals, there was little or no encouragement or opportunity for a physician to record his observations. The professor in a medical school might, in an introductory notice to the thesis of one of the students—the so-called programma or propempticon inaugurale—make a statement, not to exceed sixteen pages upon any subject, whether connected with that treated of in the thesis or not, and sometimes such a paper was continued through the programmata of twenty or thirty different dissertations, making it very difficult at the present day to secure the entire work.

[1] The figures of this distribution among publishers are only an approximation, and are probably too small, since the publishers' names are not stated in many of the lists of books from which titles have been derived.

But if the country doctor had a communication to make to his brethren, he must either do it by a pamphlet printed at his own expense, or must forward it to some one connected with a medical school or scientific association, and trust to him that it should be made known and recorded. The professors themselves, as was natural, gave the greater part of their thought and labour to their systems, theories, and commentaries.

It was the day of large books, and unless one could produce a volume, he received little encouragement to write. At the present day, the demand for brief papers and reports of single cases, exceeds the supply.

The weekly and monthly periodicals are omnivorous and insatiable in their requests for contributions. Through the medical journals have been given to the world nearly all the discoveries which the science and art of medicine owes to American physicians. They furnish the original data which are the foundations of monographs and text-books, and their files remain interesting and valuable when the latter have become obsolete and are forgotten.

Medical journalism in the United States presents some peculiarities, although not nearly so many as is commonly supposed, and has been the subject of severe, and, to some extent, merited criticism; but while it includes some of the worst, it also contains the best of our medical literature, and some details as to its rise, progress, and character, may therefore be of interest.

The first medical journal printed in this country was a selection and translation from the "Journal de Médecine Militaire," issued in Paris from 1782 to 1788. This translation was published in New York about 1790, forming a volume of one hundred and twenty pages 8vo., which is quite rare.[1] The original journal from which this is made up is one that is valuable to the army surgeon; and the reprint is here referred to as being the first medical journal printed in the United States, and because the fact of its existence is probably known to very few.

The first American medical journal was a quarterly, "The Medical Repository," edited by S. L. Mitchell, Edward Miller, and E. H. Smith, and published at New York, from 1797 to 1824. That this met an existing want is shown by the fact that the demand for the earlier volumes was sufficient to warrant the issue of a second edition of the first and second volumes in 1800, and a third edition of the same volumes in 1804–5.

Dr. Elihu H. Smith, the projector of this journal, was born in Connecticut in 1771, graduated at Yale in 1786, and died in 1798. Although so young, he had edited several works, and contributed largely to literary periodicals, as well as to his own medical journal.

Dr. Samuel L. Mitchell, 1764–1831, studied under Dr. Bard, and graduated in medicine at Edinburgh, in 1786. As Professor of Chemistry and Natural History in Columbia College, and from 1820 to 1826 of Materia Medica and Botany, chief editor of the "Medical Repository," representative in Congress in 1801–4, and 1810–13, and United States Senator, 1804–9, he lectured and wrote upon almost all subjects, and his papers are scattered through various periodicals at home and abroad. He was rather a naturalist than a physician, and has very properly been called a "Chaos of Knowledge."

Dr. Edward Miller, 1760–1812, was a native of Delaware, and a gradu-

[1] "A Journal of the Practice of Medicine, and Surgery and Pharmacy in the Military Hospitals of France. Published by order of the King. Reviewed and digested by M. De Horne, under the inspection of the Royal Society. Annotated from the French by Joseph Brown. No. I., vol. i., New York: J. McLean & Co."

ate of the Medical Department of the University of Pennsylvania in 1789. In 1807 he accepted the chair of the Practice of Physic in the College of Physicians and Surgeons, and in 1809 was appointed one of the Physicians to the New York Hospital. His writings were collected and published in one volume in 1814, the most important being his papers on Yellow Fever.

The idea of the publication of the "Medical Repository" was probably taken from the "Annals of Medicine" of Duncan, a continuation of the "Medical and Philosophical Commentaries of Edinburgh," and of which the "Edinburgh Medical Journal" of the present day is the successor. Although, owing to the tastes of Dr. Mitchell, it contains many dissertations which are now obsolete, the entire set of twenty-three volumes is even to-day well worthy of a place in the physician's library. At its close its subscribers passed to the "New York Medical and Physical Journal," and from that time, New York city has never been without a medical periodical.

Thirty-one medical journals have been commenced in that city, besides nine devoted to specialties, and six reprints of foreign journals. The most important of these, in addition to those already named, are the "American Medical and Philosophical Register," edited by Drs. Hosack and Francis, 1810–14; the "New York Medical Magazine," edited by Mott and Onderdonk, the "New York Journal of Medicine and Surgery," 1839–41, one of the best journals in this country, edited by Drs. Watson and Swett, the "New York Journal of Medicine," edited by Forry, Lee, Stephen Smith, and others, continued as the "American Medical Times," of which the "Medical Record" of to-day may be considered as the representative; the "New York Medical Journal," edited successively by Drs. Hammond, Dunster, and Hunter, 1865–76, and the "Archives of Scientific and Practical Medicine," edited by Brown-Séquard, 1873, which unfortunately ceased with its fifth number. The "Buffalo Medical Journal," edited by Dr. Austin Flint, 1845–60, and then merged in the "American Medical Monthly," is also a valuable series.

The second medical journal published in this country was the "Philadelphia Medical Museum," edited by Dr. Coxe, 1804–1811, followed almost immediately by the "Philadelphia Medical and Physical Journal," edited by B. S. Barton, and published at irregular intervals, 1804–1809. This journal, as was to be expected from the tastes of its editor, contains a large proportion of articles on natural history. Other well-known journals published in Philadelphia are the "American Medical Recorder," a quarterly, 1818–29, whose subscription list passed to the "American Journal of the Medical Sciences;" the "North American Medical and Surgical Journal," 1826–31; the "Medical Examiner," 1838–56, which united with the "Louisville Review," forming the "North American Medico-Chirurgical Review," 1857–61; the "Medical and Surgical Reporter," 1856–76; the "Photographic Review of Medicine and Surgery," 1870–72; and the "Philadelphia Medical Times," 1870–76.

The most important journal on our list is the "American Journal of the Medical Sciences." This began as the "Philadelphia Journal of the Medical and Physical Sciences," in 1820, under the editorship of Dr. N. Chapman, who is said to have undertaken it under the stimulus of the phrase of Sidney Smith, so often quoted during the past year: "Who reads an American book?" In 1825 a new series began, edited by N. Chapman, W. P. Dewees, and J. D. Godman. This continued until 1827, when Dr. Isaac Hays, who had been associate editor in the last volume—number five of the new, or fourteen of the whole series—took charge of the Journal

and gave it its present name. The ninety-seven volumes of this Journal need no eulogy. They contain many original papers of the highest value; nearly all the real criticisms and reviews which we possess; and such carefully prepared summaries of the progress of medical science, and abstracts and notices of foreign works, that from this file alone, were all other productions of the press for the last fifty years destroyed, it would be possible to reproduce the great majority of the real contributions of the world to medical science during that period. It is evident that its editor has exercised a careful supervision over every part, but his personality is nowhere apparent, there being no editorial articles, and very few papers appearing over his signature.

Baltimore produced the third of our medical journals, the "Baltimore Medical and Physical Recorder," edited by Dr. Tobias Watkins, 1808–9. This only reached number one (1) of the second volume, and it is somewhat curious that of the ten medical journals and one reprint which have been commenced in that city, the duration of each has been comparatively brief. One little known may be referred to, "The Baltimore Philosophical Journal and Review," edited by Dr. J. B. Davidge, of which one number was published in 1823. It contains "a memoir on fractures of the thigh-bone," and "a case of extirpation of the parotid," each by the editor.

The first medical periodical published in Boston was of a popular character, "The Medical and Agricultural Register," 1806–7. The "New England Journal of Medicine and Surgery" began as a quarterly in 1812, and in 1828 was consolidated with the "Boston Medical Intelligencer," and became a weekly, forming "The Boston Medical and Surgical Journal," which has continued to the present time. The original quarterly was well edited, and contains some valuable papers. Under the editorship of Dr. J. V. C. Smith, which lasted for over fifty volumes, it would seem that no articles were ever refused admission to the weekly. As stated by Dr. Hunt,[1] "John C. Warren and X. Chabert were received with equal courtesy. In its department of reviews it was most complacent. From Rokitansky to Mrs. Joel Shew all were erudite. On its editorial pages nothing was attacked, everything was conciliated. Legitimate medicine was right to be sure, but the community would appreciate it better if it were not quite so right. Contributors of merit dropped off, and the journal became the receptacle of more 'remarkable cases' than any other was ever blessed with." From the date of this criticism there has been great improvement, and it is to-day one of the best.

The first medical journal west of the Alleghanies was the "Western Quarterly Reporter of Medical, Surgical, and Natural Science," edited by John D. Godman, Cincinnati, 1822–23, which reached number two of the second volume. This was followed by the "Ohio Medical Repository," edited by Guy W. Wright, issued semi-monthly, Cincinnati 1826–27. This has become one of the rarest of American medical journals. The only articles of interest which it contains are a series of papers by Dr. John Locke, on the Medical Botany of the West, and a few reports of cases and contributions to pathological anatomy, by Dr. John P. Harrison. (This journal must not be confounded with another of the same name, published at the same place, in 1835–36.) It was merged into the "Western Medical and Physical Journal," edited by Drs. Daniel Drake and Wright.

[1] Buffalo Medical Journal, 1856, xii. p. 312.

At the end of the first volume, in 1828, the editors agreed to disagree, and Dr. Wright published one number of a second volume, but the real continuation was issued by Dr. Drake, under the title of the "Western Journal of the Medical and Physical Sciences." This contained some of Dr. Drake's best and most characteristic writings, and forms a valuable and interesting series.

Two attempts were made by Dr. Eberle to establish a journal at Cincinnati; the first, the "Western Medical Gazette," after one or two suspensions, ceased with the second volume, in 1835; the second, the "Western Quarterly Journal of Practical Medicine," 1837, did not get beyond the first number. "The Western Lancet," edited by L. M. Lawson, continued from 1842 to 1857, when it took the name of "The Cincinnati Lancet and Observer," which is still flourishing. Several medical journals were started at Columbus, only one of which, "The Ohio Medical and Surgical Journal," 1848–64, was successful. A rare medical periodical and curiosity in its way is "The Belmont Medical Journal," published at Bridgeport, Ohio, under the auspices of the Belmont County Medical Society, 1858–60. With this belong the transactions of the same society from 1847 to 1857, forming in all, three small volumes in 12mo. These publications are unique in their way, and illustrate what can be done by a county medical society, composed entirely of country practitioners. They contain some amusing flights of rhetoric, and some well-recorded cases, and many of the papers are interesting because it is evident that they were written precisely as the authors talked.

The first medical journal of Kentucky was the "Transylvania Journal of Medicine," a quarterly, published at Lexington, from 1828 to 1839, forming a series of twelve volumes, of which complete sets are rare and valuable. In 1840 commenced "The Western Journal of Medicine and Surgery," Louisville, 1840–55, which may be considered as a continuation of Dr. Drake's "Western Journal," above referred to, combined with the "Louisville Journal of Medicine and Surgery," edited by Drs. Yandell, Miller, and Bell, in 1838, and of which but two numbers were published.

"The Richmond and Louisville Medical Journal," now in course of publication, edited by Dr. E. S. Gaillard, 1868–76, is a continuation of the "Richmond Medical Journal," published at Richmond, Va., 1866–68. "The American Practitioner," edited by Drs. D. W. Yandell and T. Parvin, 1870–76, is a continuation of the "Cincinnati Journal of Medicine," commenced in Cincinnati in 1867.

"The Illinois Medical and Surgical Journal" commenced at Chicago in 1844, and has continued to the present time under various names, being now known as "The Chicago Medical Journal and Examiner."

The first journal published west of the Mississippi was "The St. Louis Medical and Surgical Journal," founded by Dr. M. L. Linton, in 1843, which is still in existence.

In the South the first medical periodical was the "Journal de la Société Médicale de la Nouvelle Orleans," a quarterly, published in 1831. A monthly journal of the same name appeared in 1859–61. The most important is the "New Orleans Medical and Surgical Journal," which, with two suspensions, has continued from 1844 to the present time. "The Southern Medical and Surgical Journal," edited by Anthony Eve and others, published at Augusta, forms a series of twenty-one volumes,

which contain many valuable cases, papers, and reports. "The Charleston Medical Journal and Review," 1846–60, and 1873–76, is the principal medical periodical of South Carolina.

In Tennessee, "The Nashville Journal of Medicine and Surgery," 1851–61, and 1866–76, and "The Southern Journal of the Medical and Physical Sciences," 1853–57, are worthy of note.

The principal medical journal in Virginia was "The Virginia Medical and Surgical Journal," edited by G. A. Otis and others, Richmond, 1853–61. In the same city was published, during the war, "The Confederate States Medical and Surgical Journal," 1864–65, a quarto sheet containing much valuable data in military surgery. Complete files of this are very rare.

On the Pacific coast eight medical journals, in all, have been commenced, two of which did not get beyond the first number. The oldest one now in existence is "The Pacific Medical and Surgical Journal," which began in 1858.

Five medical journals have been commenced in Michigan, two of which are now in existence.

Connecticut, Iowa, Maine, Minnesota, New Hampshire, New Jersey, Oregon, Vermont, and West Virginia have each had one journal, all of which are now extinct except "The West Virginia Medical Student." Perhaps two may be claimed from Maine, counting "The Journal of the Medical Society of Maine," one number of which was issued at Hallowell in 1834.

Of journals devoted to dentistry there have been about twenty, making one hundred and thirty volumes in all.

The earliest one was the "American Journal of Dental Science," which commenced in New York, in 1839, was suspended from 1860 to 1867, and is still in existence.

In 1876 there are four dental journals in existence in this country, while England has but one, France two, and Germany one.

Of journals devoted to pharmacy, there have been six worth mentioning; the oldest being the present "American Journal of Pharmacy," which began in 1825, as the "Journal of the Philadelphia College of Pharmacy." This journal is by far the most valuable of this class in this country, and is furthermore noteworthy, and to be specially commended for having done what no medical journal in this country has accomplished, namely, the publishing of a complete index for its series, which was done in 1873, and which doubles the practical value of the set. The total number of volumes published of this class is ninety-four.

Besides the regular encyclopedic medical journals, there have been about as many more devoted to "isms" and "pathies," and to popular and family medicine and hygiene, many of these last being merely advertisements.

With the recent development of specialties in medicine, several journals devoted to particular subjects have appeared, and an increase in the number of these may be expected.

In this connection may be mentioned, as a curiosity in literature, a periodical publication devoted to the abuse of an individual physician, namely, the "Rush Light," published in New York in 1800, by William Cobbett, under the pseudonym of Peter Porcupine, for the vilification of Dr. Benjamin Rush. Seven numbers were issued, of which only the first two bore the imprint of place of publication, the last two were printed in London, and a complete set is very rare.

A most powerful agent for the diffusion in this country of the knowledge of the labours and writings of European physicians, has been the republication of the principal English Quarterly Reviews, of "Braithwaite's Retrospect," and of "Ranking's Abstract." To this should be added, perhaps, the so-called "American Edition of the London Lancet," which is a selection rather than a reprint, and the subscription list of which was at one time very large.

Of journals printed in foreign languages, there have been commenced, three in German, three French, and one Spanish. The French journals were all issued at New Orleans: two of the German journals appeared in the State of New York, and one in Philadelphia.

The Spanish journal was intended mainly for circulation in Cuba.[1] Its issue ceased with the third number.

Our medical journals vary so much in character, style, and purpose, that it is hardly possible to make any assertion with regard to the mass which shall be at the same time broad and true. They may be divided into three classes: first, those not connected with any medical school, and which draw their contributions from a wide field, including such as the "American Journal," "The New York Journal," "The Medical Record," "The Medical Times," and "The Boston Medical and Surgical Journal;" second, those which rely for contributions and material mainly on the professors of a medical school and the hospital clinics connected with it, but which are not specially devoted to its interests; third, those which are mainly devoted to advocating the interests of a school, and the attacking rival institutions, and which are, to use Carlyle's phrase, "Windmills put out to catch or take advantage of the wind of popular favour." These journals sometimes contain valuable reports of cases obtained from the college clinics, but the personal editorial element in them is usually in excess, and they are of interest to but a small local circle. To them applies the untranslatable French criticism, "Il y a trop de tintamarre la dedans, trop de brouillamini."

Of the first class, some compare favourably with the best of the journals of other countries: of the last class, some are as bad as, but not worse than, the worst. Comparatively few persons are acquainted with the poorer class of foreign medical journals, published in the smaller towns of the provinces, which have most of the defects which are so strongly condemned in some of our own publications as if they were unique.

The reports to the American Medical Association, by its committees on American Medical Literature, devote much space to periodicals, and contain many judicious criticisms upon their defects and errors. A common complaint is that there are too many. The reply to this is usually that of Dr. Drake, that it is desirable that the country practitioners be induced to write, and that one means of doing this is the diffused localization of journals. This is due to the fact that inexperienced and modest men will furnish an article or report to a journal in their immediate neighbourhood, with whose editor they are personally acquainted, while they would not do so to one at a distance.

The number of subscribers to the greater number of our journals is small, the issue being, for many, less than a thousand, and, for some, hardly five hundred copies.

[1] "Revista Medico-Quirurgica y Dentistica." Quarterly. New York and Havana, 1868.

The motive for the existence of the minor journals is not for direct profit, but as an indirect advertisement for certain individuals, or—and this is more common—the desire to have a place in which the editor can speak his mind and attack his adversaries without restraint. The defects in the medical journals are, to a certain extent, the characteristic ones in our medical literature, and are chargeable mainly to the lack of general education and mental culture in the majority of readers whose tastes are to be accommodated. An urgent want of many of the subscribers is a sort of continuation of the course of education given in the schools. We find, for instance, in the pages of some medical journals, articles which make no pretensions to originality, but are simply didactic lectures to a class *in absentia*. The defects in the so-called original contributions are, for the most part, due to imperfect education in the writers, and betray, not merely an ignorance of facts previously ascertained and recorded, but defective mental training and an inability to comprehend the relations of the facts which are known, the result of which is the stringing out of a series of irrelevant and tedious details, and, in the attempts at deduction, the production either of vague and valueless generalizations, or conclusions which do not follow from the premises. As an illustration, take the majority of the articles which have appeared on a disease which would seem to be peculiar to this country, viz., the so called "milk-sickness" or "trembles."

Since the first notice on this affection in Dr. Drake's Notices of Cincinnati, in 1809, there have been printed four pamphlets and one hundred and ten (110) articles in journals and transactions, on this subject. Yet it cannot be said to-day, that we have any definite knowledge as to the pathology or causes of this affection, or that, so far as man is concerned, we are absolutely certain that there is any special disease which should be thus named, as being caused by the milk, or flesh of cattle affected with the "trembles." It has been said to be caused by certain plants, yet no scientific experiments have been made on the effects of these plants. No attempt has been made to produce the disease in an animal remote from infested localities, by the use of the suspected plants, or better, by the use of an extract containing their active principles; no chemical or microscopical examinations have been made, in short, we have nothing but an account of symptoms, and much of that is from hearsay.

Many articles intended to be practical, are very far from being such, although the authors would probably be surprised and indignant to hear them termed otherwise. They profess to give the results of the writer's personal experience with a certain disease, but this disease is only named, not described, and the gross results only are given, that is to say, we are told how many recovered. The object of such writers, to use their own words, is to tell us "what is good for biliousness, or low fever, or pneumonia." Their productions read curiously, like the literature of the last century, and are to be classed with old women's advice; amusing generally; practically suggestive sometimes; clear, scientific, and conclusive, never.

The so-called clinical lectures, and reports of cases and operations, are of two kinds. When properly prepared they are most useful and valuable, and are the best contributions to a journal which the majority of physicians can make, although by no means the highest class of medical literature. But a large number of such articles as are pub-

lished, are simply padding, worse than useless, since their titles become a part of the bibliography of medicine, compelling each succeeding inquirer to refer to them, or risk the loss of some really valuable reference.

We have reached that stage of development, when it is in no way desirable that we should be informed that one dislocated shoulder was reduced, one leg amputated, and two hare-lips operated upon, not even if the usual text-book explanations are added, so as to make up the five or six pages of the report of a college clinic. We have had enough reports of specimens of "Aneurism of the Aorta," or "Medullary Sarcoma," or "Tumour of the Breast," in which little or no information is given with regard to the symptoms during life, and the principal fact stated is the size or weight of the specimen.

It is a useless case of labour which lingers through three or four pages, to terminate in the usual manner with the stale old moral about "meddlesome midwifery," and it is at once amusing, exasperating and pathetic, to glance over the "contributions from the clinic" of the young specialist who has set to work to write himself into notice, not in a journal devoted to his specialty, but in one of the encyclopedic periodicals, having been instructed that this is "legitimate advertising."

"Medical journalism is not a profession in this country. With one or two exceptions, our medical editors are engaged in practice and lecturing, and their labour in connection with the journals is not directly remunerative, nor is it the main object of their thoughts." The result of this appears in that large section of almost every journal which is devoted to reviews, abstracts, news items, etc. Nevertheless, as we have before stated, our medical journals are the most important and valuable part of our medical literature, and it is mainly in and by them that improvement may be hoped for and effected.

At the beginning of 1876, there were in course of publication throughout the world about 280 regular medical journals. Of this number, Germany and Austria had 57; France 52; Great Britain, not including her Colonies 29; the United States 46; Italy 31; Belgium 8; Mexico 8; Canada 7; Holland 6; Spain 6. As to the form of publication, the United States has the largest proportion of monthlies, and France and Germany of weeklies and bi-weeklies.

The proportion of periodical to other forms of medical literature is in excess in this country, as will be clearly seen if we compare the number of medical books published in the several countries. Taking the "Bibliotheca Medico-Chirurgica," of Ruprecht, for the years 1874–75, and counting the publications noted in it, excluding journals, pamphlets, and popular and irregular works, we find that the United States is credited with 55 volumes; England 179; France 409; Germany 419; Italy 120; Spain and Portugal 104. If we count only first editions of original works, we find that the United States has published during these two years 36; England 92; France 314; Germany 288; Italy 88; and Spain and Portugal 30.

These figures are, of course, not exact, but the proportions shown are probably nearly correct. Taking the number of volumes of medical publications of all nations, excluding journals, for these two years, the United States has published about six per cent. of the whole, certainly not the quantity which should have been produced if everything was as it should be.

Medical Societies.—An important influence upon the progress of medicine, and the relations of physicians to each other, and to the public, has been exerted by our medical societies, some of which date from the last century, and which are found almost everywhere. The first State medical societies, such as those of New Jersey, Massachusetts, Delaware, New York, etc., were charged with the duty of licensing persons to practise medicine, to which license an examination was a necessary preliminary. In this way these societies were the principal agents in fixing the standard of medical education, and although after the establishment of medical schools the diploma of one in good repute was accepted in lieu of an examination, this was by courtesy rather than law, and made it necessary that the standard of the schools should at least be equal to that prescribed by the society. For convenience of reference, we give a list of the most important medical societies of the United States, arranged in alphabetical order by States:—

	Organized.	First publication.	No. of vols. of publications.
American Medical Association	1847	1848	27
American Ophthalmological Society	1864	1865	7
American Otological Society	1868	1869	1
American Pharmaceutical Association	1852	1852	24
American Public Health Association	1872	1875	1
National Quarantine and Sanitary Convention	1857	1857	4
Medical Association of the State of Alabama	1847	1848	19
State Medical Association of Arkansas	1870	1871	5
Medical Society of the State of California	1870	1870	5
Territorial Medical Society of Colorado	1871	1872	5
Connecticut State Medical Society	1792	1844	20
Medical Society of Delaware	1789	.....	...
Medical Society of the District of Columbia	1833	1874	2
Clinico-Pathological Society of Washington	1865	.....	...
Florida Medical Association	1874	1875	1
Georgia Medical Association	1849	1850	20
Georgia Medical Society of Savannah	1804	.....	...
Illinois State Medical Society	1851	1851	23
Drake Academy of Medicine	1872	1874	1
Indiana State Medical Society	1849	1849	27
Iowa State Medical Society	1850	1850	10
Medical Society of the State of Kansas	1858	1867	2
McDowell Medical Society	1874	1875	1
Kentucky State Medical Society	1851	1851	19
Société Médicale de la Nouvelle Orleans	1812	1831	3
Medical Society of the State of Maine	1834	1834	1
Maine Medical Association	1853	1853	6
Medical and Chirurgical Faculty of Maryland	1789	1853	4
Boston Society for Medical Improvement	1828	1853	5
Boston Society for Medical Observation	1846	.....	...
Boylston Medical Society	1811	70 prize essays published in journals.	
Gynæcological Society of Boston	1869	1869	5
Massachusetts Medical Society	1781	1790	41
Michigan State Medical Society	1819	1850	15
Minnesota State Medical Society	1855	1870	6
Medical Association of the State of Mississippi	1856	1870	1
Medical Society of the State of Missouri	1850	1850	12
Nebraska State Medical Society	1868	1869	6
New Hampshire Medical Society	1791	1854	21
New Jersey State Medical Society	1766	1859	17
Medical Association of Southern Central New York	1847	1848	11

	Organized.	First publication.	No. of vols. of publications.
Medical Society of the County of Albany	1806	1864	2
Medical Society of the County of Kings	1822	1858	2
Medical Society of the County of New York	1806	.....	...
Medical Society of the State of New York	1807	1808	34
Medico-Legal Society of New York	1867	1874	1
New York Academy of Medicine	1847	1851	8
New York Medical Journal Association	1864	.....	...
Pathological Society of New York	1844	.....	...
Physico-Medical Society of New York	1815	1817	1
Medical Society of the State of North Carolina	1850	1850	22
Academy of Medicine of Cincinnati	1857	.....	...
General Medical Society of Ohio	1827	1829	2
Medical Convention of Ohio	1835	1835	13
Ohio State Medical Society	1846	1850	26
Belmont Medical Society	1847	1848	8
Medical Society of the State of Oregon	1874	.....	...
College of Physicians of Philadelphia	1787	1793	11
Medical Society of the State of Pennsylvania	1848	1851	16
Pathological Society of Philadelphia	1857	1869	4
Philadelphia County Medical Society	1849	.....	...
Philadelphia Obstetrical Society	1868	1873	3
Rhode Island Medical Society	1812	1859	1
Medical Society of South Carolina	1789	.....	...
South Carolina Medical Association	1848	1849	16
Tennessee State Medical Society	1830	.....	...
Medical Association State of Texas	1869	1869	4
Medical Society of the State of Vermont	1814	1864	4
Medical Society of Virginia	1821	1871	5
Medical Society of Washington Territory	1873	1873	3
Medical Society of the State of West Virginia	1867	1868	8
Wisconsin State Medical Society	1842	1856	9

The formation of the American Medical Association was due to a wide spread and loudly expressed dissatisfaction on the part of the leading physicians of the country, with the low standard of medical education, and to a general conviction that the remedy for this lay neither with the schools nor the State medical societies. It was hoped that by forming an association which should represent all parties interested, a sufficient pressure of opinion might be brought to bear upon physicians and upon the schools, to secure the return to the requirements for graduation of the earlier medical colleges. After one or two futile attempts, the New York State Medical Society set on foot a movement which resulted in a meeting of a convention in the city of New York, in the year 1847, in which were present representatives of medical societies and colleges from sixteen States. A similar convention met the following year in Philadelphia, at which the title, by which it is now known, was assumed. The series of its annual volumes of transactions contains some reports and papers of much value and interest, mingled with much that is unworthy of publication under the auspices of our National Medical Society, or indeed of any other. Many of the reports of the chairmen of the several committees are of permanent historical value. Its most valuable contribution to our literature, has been the publication of a code of ethics, which is, theoretically at least, accepted as authoritative throughout the United States, and which, although some of its provisions have been objected to, is, as a whole, the most satisfactory exposition in existence of the proper relations of physicians to each other, and to the public.

Of late years, the original purpose of this association has been to some extent departed from.

It was not primarily intended to promote literature or scientific research, or to afford a means of publication for writers. Our national and State medical societies have been mainly useful as social gatherings, promoting acquaintance, and the feeling of professional brotherhood and *ésprit de corps* among their numbers, and as giving the means for agreement, and the expression of opinion, upon questions relating to education, ethics, etc.; by that large body of physicians engaged in general practice, who do not write or lecture, but simply vote. As sources of addition to the science and literature of medicine, they do not play a conspicuous part, nor is it easy to see how it can be otherwise; the real discovery, the carefully prepared paper, the description of a new symptom, pathological appearance or remedy are not usually communicated to such societies. No effectual supervision as to quality of papers which may be read or printed can, or at least will be exercised by committees, and a communication which a first class medical journal has "declined with thanks," may be taken to the State, and even to the National Society with a reasonable certainty that it can be made to appear in the transactions. The discussions on papers in such associations seldom have any scientific value, from want of special preparation on the part of the speakers, although they are sometimes amusing, and, to use an expressive word, "spicy," from the use of personalities. Whether this state of things can be improved is doubtful, though attempts to do so are of course commendable.[1]

The journals have to a great extent superseded the necessity of using societies as a means of publication, and the best work of such associations seems to consist in bringing the leaders into personal relation with the mass of the profession, and in serving as courts of arbitration and appeal, where local difficulties can be adjusted, and whose decisions will command the assent of the majority of their members.

The Transactions of the New York State Medical Society were, for a number of years, published by the State, which proved, upon the whole, to be not a desirable mode of issue, and the last volume, published by the society itself, is a great improvement upon its predecessors. What such societies might do is shown by the paper of Dr. Thomas C. Brinsmade, giving an accurate record of his practice for twenty-one years. This makes 300 pages of the volume of the Transactions of the New York State Medical Society for 1858, and contains carefully analyzed statistics of 37,872 cases. This had been preceded in 1851 by an elaborate account of the medical topography of the city of Troy, his place of residence. Taken together, these papers are very valuable, and set an example of a mode of adding to the store of medical knowledge, which is within the power of every practitioner.

An interesting experiment is now in course of trial in Alabama, where the State Medical Society has been made the State Board of Health, and the official adviser of the Legislature in all matters pertaining to public hygiene.

[1] The best suggestion to this end for the American Medical Association which I have heard is that each section should elect its own officers and members, and should be managed by a special committee who shall designate the subject for discussion, and the leaders in debate. If the members of the committee each year are selected from a single city, it would have an additional advantage. For instance, let the managing committee of the surgical section be, this year, all residents in New York city, while Boston takes obstetrics, Philadelphia practice, etc. The next year New York can take practice, Chicago surgery, etc. In other words, transfer all the responsibility for scientific work to the sections, and let these sections be organized and managed systematically to that end alone.

The American Public Health Association, organized in 1872, may now be considered as fairly established. The operations of this society have special interest to the medical profession, since it may become an important means of educating the public, and enabling it to distinguish between the scientific physician and the ignorant pretender.

We have another class of medical societies which require an abundance of clinical and pathological material; members actually engaged in original investigations, and frequent meetings, as conditions for usefulness and success. As a rule, these can only exist in large cities, where they exert a powerful influence and stimulus to exertion on their individual members. It must be admitted that our societies of this kind seldom bring out the best work of their members, and that such discussions as occur in similar societies in London and Paris, continued week after week, and even month after month, for which elaborate preparation is made by the speakers, and in which the results of clinical observation and extensive literary research are rendered attractive and striking, by splendor of diction and perfection of style, are very rare.

The most important of these societies are the College of Physicians of Philadelphia, the New York Academy of Medicine, the pathological societies of Philadelphia and New York, the Boston Society for Medical Improvement, and certain societies devoted mainly to specialties. Among these should be mentioned the Medico-Legal Society of New York, organized in 1867. In 1874 it published a volume of papers relating to medical jurisprudence, which will be followed by others. It is also forming a valuable library in its own department, and has been the means of bringing the members of the medical and legal professions of New York to better acquaintance with each other. It is but justice to say that much of its good work and prosperity is due to the energy of its late president, a prominent lawyer, Mr. Clark Bell.

The majority of our physicians are, and must be, content to leave to a few special workers the labour and pleasure of sifting and selecting from the original sources of medical literature, having neither the wish nor the power to examine for themselves the works of the great leaders and teachers of times past, or the mass of books and pamphlets which are daily streaming from the press; but there is nevertheless among them a fair amount of appreciation of the value and necessity of such work, and of the usefulness and desirability of collections of the records of their science. During the last ten years, the writer has had occasion to examine many private libraries of physicians in all parts of the country, in country villages as well as the large cities, and it has been a matter of surprise and pleasure to find so much interest taken in subjects relating to the history and bibliography of medicine by men remote from large libraries, and without the stimulus of companionship in, and sympathy with such tastes. And it will usually be found that the physician who has on his shelves half a dozen old folios and quartos, including perhaps copies of Sydenham, Morgagni, and Van Swieten, is a man of more culture and broader views than the one who has only the modern manuals, or rather those which were modern when he attended lectures.

Until recently few of our writers have made much use of bibliographical research. We now have public medical libraries in this country, which afford to the student and scholar good facilities for research, and which bid fair, at no distant day, to rival in magnitude and practical working value, if not in manuscripts and incunabulæ, the best in the old world.

Philadelphia has several libraries of much interest and value to the medical bibliographer and scholar. The oldest medical library in this country is that of the Pennsylvania Hospital, founded in 1762, and now containing about 13,000 volumes, many of which were selected for the hospital by Doctors Lettsom, in London, and Louis, in Paris. Its classed catalogue, issued in 1857, is a valuable work of reference.

The library of the College of Physicians, of Philadelphia, which dates from 1788, now contains about 19,000 volumes well selected, receives about eighty current journals, and, next to the library at Washington, is the most valuable collection of the kind in this country. Much of its prosperity and excellence is due to Doctor Samuel Lewis, whose donations, amounting to several thousand volumes of choice books, are kept in a room by themselves, and known as the "Lewis Library." The great want of this library is a good printed catalogue, which would double its value and usefulness. The medical part of the Loganian Section in the Philadelphia Library contains about 1800 volumes, mostly old and rare. These three libraries supplement each other to a great extent, there being probably not less than 26,000 volumes between them, which are not duplicates. The fourth library is at the University of Pennsylvania, in West Philadelphia, and contains about 3000 volumes, the gift Dr. Alfred Stillé. It may be noted here that almost all attempts to establish medical libraries in connection with medical schools have been failures. Commenced with enthusiasm, they soon become antiquated, are rarely consulted, except by one or two species of beetles, are never properly catalogued or cared for, and dust and mould reign in them supreme. Students and teachers want the newest books and journals only. Libraries are used by the scholar and author, and for such are the true universities.

In New York, the library of the New York Hospital is the largest of its class, containing about 10,000 volumes. An excellent foundation for a library has been acquired by the Academy of Medicine, by the gift from Dr. Purple of a complete file of regular American medical journals and of a large number of rare pamphlets. The collections of journals of the Medical Journal Association of New York, and the German Dispensary are valuable sources of information to the student.

The Boston Public Library has at present the best collection of medical books in that city, numbering about 11,000 volumes, for the most part standard works and periodicals. Its usefulness is much diminished from the want of a good printed catalogue of this section. The library of Harvard College contains between 5000 and 6000 volumes on medicine; and the Treadwell Library, at the Massachusetts General Hospital, has about 5000 volumes. The medical library of most promise in Boston is that of the Medical Library Association, which, though only a year old, has about 3000 volumes, and will probably rapidly increase.

In Cincinnati the City Hospital has a fair collection. The Mussey Medical and Scientific Library, at present, is a special deposit in the Cincinnati public library, and contains about 4000 volumes and 2000 pamphlets.

The National Medical Library at Washington, under the direction of the Surgeon-General of the Army, contains 40,000 volumes, and about the same number of pamphlets. It has been formed within the last twelve years, and the use that is made of it by physicians from all parts of the country, and the general and strong interest that is felt in its progress

affords satisfactory evidence, if such were needed, that it meets a want of the profession. Its subject catalogue is nearly ready for the press.

Besides these public libraries, there are several valuable private collections of medical works in this country, some of which have been already given to public use, such as those of Drs. Purple, Stillé, and Mussey, already referred to. Two others are worthy of special mention, the first being that of Dr. G. J. Fisher, of Sing Sing, which is rich in the classics of medicine; and the second, that of Dr. J. M. Toner, of Washington, which is especially devoted to American medical literature, and contains many rare pamphlets, besides a nearly complete file of American medical journals. In connection with this last, there is nearly ready for the press a complete index. Besides these, there are a number of valuable private medical libraries in this country, ranging from 1000 to 8000 volumes, and the number of foreign works imported, and the taste for original editions is steadily increasing. It is now possible to verify in this country the majority of the references made by European medical authors, and it is no longer necessary to make costly importations, or to visit Europe to obtain literary data.

With the libraries should be classed the *medical museums*, of which several of much interest and importance have been formed in the United States, for the most part in connection with medical societies and hospitals. The catalogues of these collections, when properly prepared, are very useful books of reference, and some excellent work of this kind has been accomplished, such as the Catalogues of the Warren Anatomical Museum of Harvard, and of the Museum of the Boston Society for Medical Improvement, each by Dr. J. B. S. Jackson; of the Pathological Museum of the Pennsylvania Hospital, by Dr. Wm. Pepper; of the Pathological Cabinet of the New York Hospital, by Dr. Ray; and of the Army Medical Museum at Washington, by Drs. Woodhull, Curtis, and Woodward.

The College of Physicians of Philadelphia has a valuable collection, including the Mütter Museum, and a series of unique preparations by Hyrtl.

The practical value of large special museums in connection with good libraries devoted to the same specialities is great, but they are useful rather to the educated physician than to the student; and the numerous small collections which are scattered over the country, in hospitals and private cabinets, are simply so much wasted and unused material, in a scientific point of view, and, though gratifying to the owner as trophies or mementoes, are of little more real use than the strings of teeth which the barbers of old hung out as signs of their skill.

The value of a single specimen of any lesion is usually very small; it is only when they can be brought together by scores and compared that useful and reliable results can be hoped for. As we get older and wiser, we shall probably have fewer journals, medical schools, museums, and libraries than we now possess, for all these means of culture, to have the best effect, require concentration.

Although the permanent importance of oral teaching has, to some extent, been diminished by the diffusion of periodical literature, since the latest discovery or theory can now be promptly made known to those remote from the great centres of learning, the increased use made of clinical instruction, and the necessity for practical demonstration of instrumental methods of diagnosis, have in a great degree compensated for this.

The medical history of a country cannot be considered complete without some account of its *medical schools*, but we have space for little more than a list of those which have flourished in the United States.

The following table gives a list of the regular chartered medical schools of this country, which have had the power of conferring the degree of doctor of medicine, with the date of first graduating class, date of cessation, and number of graduates to the spring of 1876, so far as it has been possible to obtain the data:—

It is possible that a few minor schools of short duration have been overlooked, but such must have been of small importance. No note is made in the list of the various changes of name which some of the schools have assumed. The number of graduates has been obtained by collation of all the catalogues that could be obtained, and by correspondence. From these data an estimate has been made for the missing years, and the limit of error in the total does not probably exceed one-half of one per cent. It should be observed that little reliance can be placed upon many of the catalogues as to the number of students in attendance, and there are some discrepancies even as to graduates.

Name.	Year of first graduation.	Date of cessation.	Total No. of graduates.
Alabama.			
Medical College of Alabama [Mobile]	1860	.....	203
California.			
Medical College of the Pacific, Med. Dept. of University (City) College [San Francisco]	1859	.....	90
University of California, Med. Dept. of (Toland Hall) [San Francisco]	1865	.....	86
Connecticut.			
Yale College, Med. Dept. of [New Haven]	1814	.....	899
District of Columbia.			
National Medical College, Med. Dept. of Columbian University [Washington]	1826	.....	427
Georgetown University, Med. Dept. of [Washington]	1852	.....	387
Howard University, Med. Dept. of [Washington]	1871	.....	37
Georgia.			
Medical College of Georgia [Augusta]	1833	.....	1278
Savannah Medical College [Savannah]	1854	.....	140
Atlanta Medical College [Atlanta]	1855	.....	560
Oglethorpe Medical College [Savannah]	1856	1861	86
Illinois.			
Rush Medical College, Med. Dept. of University of Chicago [Chicago]	1844	.....	1786
Illinois College, Med. Dept. of [Jacksonville]	1848	1848	39
Rock Island Medical School [Rock Island]	1849	1849	19
Chicago Medical College, Med. Dept. of Northwestern University [Chicago]	1860	.....	481
Indiana.			
Indiana Medical College, Med. Depart. of Laporte University [Laporte]	1842	1851	136
Medical College of Evansville [Evansville]	1850	.....	74
Indiana Central Medical College [Indianapolis]	1850	1852	39
Indiana Medical College [Indianapolis]	1870	.....	251
Indiana College of Physicians and Surgeons [Indianapolis]	1875	.....	.....

Name.	Year of first graduation.	Date of cessation.	Total No. of graduates.
Iowa.			
College of Physicians and Surgeons [Keokuk]	1850	.....	777
Iowa State University, Med. Dept. of [Iowa City]	1871	.....	111
Kentucky.			
Transylvania University, Med. Dept. of [Lexington]	1818	1859	1860
University of Louisville, Med. Dept. of [Louisville]	1838	.....	2395
Kentucky School of Medicine [Louisville]	1851	.....	520
Louisville Medical College [Louisville]	1870	.....	402
Hospital College of Medicine, Med. Dept. of Central University [Louisville]	1875	.....	91
Louisiana.			
University of Louisiana, Med. Dept. of [New Orleans]	1835	.....	1703
New Orleans School of Medicine " "	1857	1870	397
Charity Hospital Medical College of N. O. " "	1876	.....	10
Maine.			
Bowdoin College and Med. School of Maine [Brunswick]	1821	.....	1137
Maryland.			
University of Maryland, Med. Dept. of [Baltimore]	1811	.....	3104
Washington University, School of Medicine [Baltimore]	1828	.....	680
College of Physicians and Surgeons "	1873	.....	118
Massachusetts.			
Harvard University, Med. Dept. of [Boston]	1785	.....	2206
Berkshire Medical College, [Pittsfield]	1823	1867	1136
Michigan.			
University of Michigan, Med. Dept. of [Ann Arbor]	1851	.....	1405
Detroit Medical College [Detroit]	1869	.....	204
Missouri.			
Missouri Medical College [St. Louis]	1841	.....	921
St. Louis Medical College " "	1843	.....	1293
Humboldt Medical College " "	1867	1869	16
Kansas City College of Physicians and Surgeons	1870	.....	46
St. Louis College of Physicians and Surgeons [St. Louis]	1870	1870	8
New Hampshire.			
Dartmouth College, Medical School of [Hanover]	1798	.....	1283
New York.			
College of Physicians and Surgeons of the City of New York, Med. Dept. of Columbia College [N. Y. City]	1769	.....	3179
College of Physicians and Surgeons of the Western District of New York [Fairfield]	1816	1840	585
Geneva College (Rutgers Med. Faculty) [N. Y. City]	1827	1830	104
Geneva Medical College [Geneva]	1835	1872	849
Albany Medical College [Albany]	1839	.....	1287
University of the City of New York, Medical Dept. of [N. Y. City]	1842	.....	3393
University of Buffalo, Med. Dept. of [Buffalo]	1847	.....	848
New York Medical College and Charity Hospital [N. Y. City]	1851	1864	310
Long Island College Hospital [Brooklyn]	1860	.....	531
Bellevue Hospital Medical College [N. Y. City]	1862	.....	1908
College of Medicine of Syracuse University [Syracuse]	1873	.....	26
Ohio.			
Medical College of Ohio [Cincinnati]	1821	.....	2170
Cincinnati College, Med. Dept. of [Cincinnati]	1836	1839	95
Starling Medical College [Columbus]	1836	.....	887

Name.	Year of first graduation.	Date of cessation.	Total No. of graduates.
Cleveland Medical College, Med. Dept. of Western Reserve College at Hudson [Cleveland]	1844	.....	1162
Cincinnati College of Med. and Surgery [Cincinnati]	1852	.....	760
Miami Medical College [Cincinnati]	1853	.....	578
University of Wooster, Med. Dept. of [Cleveland]	1865	.....	328
Oregon.			
Willamette University, Med. Dept. of [Salem]	1867	.....	63
Pennsylvania.			
University of Pennsylvania, Med. Dept. of [Philadelphia]	1768	.....	8845
College of Philadelphia [Philadelphia]	1790	1791	10
Jefferson Medical College "	1826	.....	6668
Pennsylvania College at Gettysburg, Med. Dept. of [Philadelphia]	1840	1861	769
Franklin Med. College of Philadelphia [Philadelphia]	1847	1849	25
Philadelphia College of Medicine "	1847	1859	502
Rhode Island.			
Brown University, Medical School of [Providence]	1814	1826	68
South Carolina.			
Medical School of the State of South Carolina [Charleston]	1825	.....	2439
University of South Carolina, Med. Dept. of [Columbia]	1858	.....	26
Tennessee.			
Memphis Medical College [Memphis]	1847	1873	231
University of Nashville, Med. Dept. of [Nashville]	1852	.....	1741
Shelby Medical College [Nashville]	1859	1861	30
Vanderbilt University, Med. Dept. of [Nashville]	1875	.....	75
Texas.			
Galveston Medical College [Galveston]	1866	.....	123
Texas Medical College and Hospital [Galveston]	1874	.....	38
Vermont.			
Castleton Medical College [Castleton]	1820	1861	1449
University of Vermont and State Agricultural College, Med. Dept. of [Burlington]	1823	.....	573
Vermont Medical College [Woodstock]	1830	1860	575
Virginia.			
University of Virginia, Med. Dept. of [Charlottesville]	1828	.....	533
Medical College of Virginia [Richmond]	1839	.....	947
Winchester Medical College [Winchester]	1846	1862	75
Total			73,588

If we take the number of graduates by decades of years during the present century, the result is as follows:—

Years.	No. of graduates.	Years.	No. of graduates.
1769–1799	221	1840–1849	11,828
1800–1809	343	1850–1859	17,213
1810–1819	1,375	1860–1869	16,717
1820–1829	4,338	1870–1876	14,704
1830–1839	6,849		

The first medical school in this country was established by Drs. John Morgan and William Shippen at Philadelphia in 1765, and is now known as the Medical Department of the University of Pennsylvania. From its

halls have graduated the majority of the distinguished medical writers, teachers, and practitioners of the United States, and the names of its professors have become household words.

Organized upon the plan of the Edinburgh Medical School, of which its founders were graduates, it has been the model and pattern by which all our medical colleges have been shaped. Its largest graduating class was in 1849, numbering 191. In the following year Professor Chapman resigned, and for the next ten years the Jefferson School graduated the greater number, reaching its maximum of 269 in 1854. The Jefferson Medical College was founded in 1824, under the charter of Jefferson College in Canonsburg, Pennsylvania. The first course of lectures was delivered in 1825–26, the Faculty being Drs. Eberle, McClellan, Rhees, Green, and Beattie. Numerous changes were made in professors, and its classes varied much in size until 1841, when all the chairs were vacated and refilled by Drs. Dunglison, J. K. Mitchell, Pancoast, R. M. Huston, Mütter, Meigs, and Bache. This Faculty continued until 1856, when Professor S. D. Gross succeeded Dr. Mütter. In 1857 Dr. T. B. Mitchell took the place of Dr. Huston, and in 1858 Dr. Dickson that of Dr. J. K. Mitchell.

The second medical school founded in this country was at New York, under the charter of King's College, in 1767. This school has had many vicissitudes, but is now in a flourishing condition, and known as the College of Physicians and Surgeons of the City of New York, being the Medical Department of Columbia College. Its largest graduating class was 110 in 1875.

The Medical Department of Harvard University was founded by Dr. John Warren in 1782. Its maximum class of graduates was 99 in 1866. Recently it has led the way in elevating the standard of medical education, by extending its curriculum to three years, establishing a graded course, and by having decided to institute a real examination into the preliminary education of its students. This has of course diminished its classes somewhat, but no one can doubt that the decision to aim at quality instead of quantity is a wise one, and will in the fulness of time receive its due reward.

The first medical school in the West was established in Lexington, Ky. So early as 1799 a Medical Department was added to Transylvania University, Dr. Samuel Brown being appointed the first professor. Various appointments in the Medical Faculty were made, and a few partial courses of lectures were delivered, but the first full course was not given until 1817, and the degree of M.D. was first conferred in 1818. The founders of the school were Drs. Dudley and Caldwell. Its period of greatest prosperity was from 1830 to 1837, at which last date a disruption took place, and a part of the Faculty removed to Louisville.

The Medical Department of the University of Louisville began as the Medical Institute, chartered in 1833. Nothing was accomplished, however, until the quarrel in the Transylvania School above referred to took place, when Dr. Caldwell enlisted in the cause of the Louisville School, and in 1837 succeeded in obtaining for it a grant of a square of ground, and money for buildings and apparatus. Lectures began the same year, the Faculty consisting of Drs. Caldwell, Cooke, and Yandell, from the Lexington School, and of Drs. Cobb, Henry Miller, and J. B. Flint. In 1839 Dr. Drake joined the School, and in the following year Dr. S. D. Gross took the place of Dr. Flint. In 1846 the School was transferred to the University, and in 1874 it had 123 graduates, its largest class.

In connection with these schools a special reference is due to Dr. Charles Caldwell, their principal promoter. He was of Irish descent, born in North Carolina in 1772; died 1853. After obtaining the best education which his native State could afford, he went to Philadelphia in 1792, and continued the study of medicine under Dr. Rush, passing his examination in 1794, and taking his diploma in 1796. During the next twenty years his pen was constantly busy with lectures, addresses, and controversial articles, many of which related to yellow fever. In 1819 he accepted an invitation to the Transylvania School, and from this time he gave his best energies to this institution, and subsequently to the Louisville School. He was one of the most voluminous writers which this country has produced, but he contributed little or nothing of permanent or scientific value to the literature of his profession, and the only work of his which is worth perusal to-day is his autobiography. His critical reviews, being dictated almost exclusively by personal prejudices, are in almost all cases samples of special pleading rather than true criticism, and characterized by their "smartness" rather than their justice.

In the South the Medical College of South Carolina, chartered in 1823, leads the way. The Medical College of Louisiana was incorporated in 1835, and in 1845 became the Medical Department of the University of Louisiana. This school is remarkable as having received State aid to the amount of $121,000.

In connection with the medical schools, notice should be taken of the Medical Institute of Philadelphia, otherwise known as the Summer School, which, in addition to furnishing instruction to students and supplementing the winter course, was of very great value as a training school for Professors. It was founded in 1817 by Dr. Chapman, and with it were connected, from time to time, Drs. Chapman, Horner, Dewees, Samuel Jackson, J. K. Mitchell, John Bell, Hodge, Neill, Gibson, Gerhard, Norris, and Pepper.

The total number of graduates from our medical schools during the five years ending July 1, 1875, was about 10,250, that is, a little over 2000 per year; the number in 1875 being about 400 more than in 1871.

Dr. J. M. Toner estimated the average age of beginning practice to be 24½ years, of death 58 years, making an average of about 34 years practice to each.[1]

Dr. S. E. Chaillé estimates that there are about 47,000 regular physicians in the United States, being about one to every 700 of the population.[2]

Space is wanting for further details with regard to our medical schools. That there are too many of them is a general complaint, the answer to which is the same as that given above with regard to the like objection with regard to medical journals, and which answer is of about the same value in each case.

In attempting to estimate the quantity and value of the additions made by the medical profession of this country to the world's stock of knowledge of the laws of healthy and diseased action, and the means of modifying these actions, it is very difficult to make generalizations which shall be at once clear, comprehensive, and correct. This difficulty becomes an impossibility, if we are to speak of the education, mental

[1] Statistical Sketch, etc. Indiana Journ. of Med., 1873, vol. iv. p. 1.

[2] The Medical Colleges, etc. New Orleans Med. and Surg. Journ., 1874, vol. i. N. S. p. 818.

characteristics, and professional qualifications of the whole body of physicians of this, or any other country, since only the most vague and indefinite statements will hold good. We have had, and still have, a very few men who love science for its own sake, whose chief pleasure is in original investigations, and to whom the practice of their profession is mainly, or only, of interest as furnishing material for observation and comparison. Such men are to be found for the most part only in large cities where libraries, hospitals, and laboratories are available for their needs, although some of them have preferred the smaller towns and villages as fields of labour. The work of our physicians of this class has been for the most part fragmentary, and is found in scattered papers and essays which have been pointed out in preceding essays; but buds and flowers, rather than ripened fruit, are what we have to offer. Of the highest grade of this class we have thus far produced no specimens; the John Hunter, or Virchow, of the United States, has not yet given any sign of existence.

We have in our cities, great and small, a much larger class of physicians whose principal object is to obtain money, or rather the social position, pleasures, and power, which money only can bestow. They are clear-headed, shrewd, practical men, well educated, because "it pays," and for the same reason they take good care to be supplied with the best instruments, and the latest literature. Many of them take up specialties because the work is easier, and the hours of labour are more under their control than in general practice. They strive to become connected with hospitals and medical schools, not for the love of mental exertion, or of science for its own sake, but as a respectable means of advertising, and of obtaining consultations. They write and lecture to keep their names before the public, and they must do both well, or fall behind in the race. They have the greater part of the valuable practice, and their writings, which constitute the greater part of our medical literature, are respectable in quality, and eminently useful.

They are the patrons of medical literature, the active working members of municipal medical societies, the men who are usually accepted as the representatives of the profession, not only here, but in all civilized countries; they may be famous physicians and great surgeons in the usual sense of the words, and as such, and only as such, should they receive the honour which is justly their due. They work for the present, and they have their reward in their own generation.

There is another large class, whose defects in general culture and in knowledge of the latest improvements in medicine, have been much dwelt upon by those disposed to take gloomy views of the condition of medical education in this country. The preliminary education of these physicians was defective, in some cases from lack of desire for it, but in the great majority from lack of opportunity, and their work in the medical school was confined to so much memorizing of text-books as was necessary to secure a diploma. In the course of practice they gradually obtain from personal experience, sometimes of a disagreeable kind, a knowledge of therapeutics, which enables them to treat the majority of their cases as successfully, perhaps, as their brethren more learned in theory. Occasionally they contribute a paper to a journal, or a report to a medical society; but they would rather talk than write, and find it very difficult to explain how or why they have succeeded, being like many excellent cooks in this respect. They are honest, conscientious, hard-working men, who are

inclined to place great weight on their experience, and to be rather contemptuous of what they call "book learning and theories." To them our medical literature is indebted for a few interesting observations, and valuable suggestions in therapeutics, but for the most part, their experience, being unrecorded, has but a local usefulness.

These three classes have been referred to simply for the purpose of calling attention to the fact that, in speaking of "the physicians of the United States," it is necessary to be careful. There are many other classes, and they shade into each other and into empiricism in many ways. In discussions upon this subject, it seems to be often assumed that all physicians should possess the same qualifications, and be educated to the same standard, which, in one respect, is like saying that they should all be six feet high, and in another, is like the army regulations, which prescribe the same ration and allowance of clothing for Maine and Florida, Alaska and Oregon. A young and energetic man who has spent six years in obtaining a University education, and four more in the study of medicine as it ought to be studied, that is to say, in preparing himself to study and investigate for the rest of his life, will not settle in certain districts. He has invested ten years' labour, and from five to ten thousand dollars, and a locality which will give him a maximum income of, perhaps, fifteen hundred dollars per annum will not be satisfactory, in part because the capital should bring a better interest, in part because he will have acquired tastes which will make his life unpleasant in such places. Yet these places must have physicians of some sort, and it is not clear as to how they are to be supplied, if some of the universal and extensive reforms in medical education which have been proposed were to be enforced.

Certainly the standard for admission and for graduation at almost all our medical schools is too low, and one-half, at least, of these schools have no sufficient reason for existence; but it is not probable that it would improve matters much to establish a uniform, which must, of course, be a minimum, standard.

Of the material aids and instruments required for the advancement of medical science, such as hospitals, libraries, and museums, we have obtained as much as could be expected. With the proper use of those we now possess will come the demand for, and the supply of, still better facilities for the work of the scholar and observer.

The defects in American medicine are much the same as those observed in other branches of science in this country, and to a great extent are due to the same causes.

Culture, to flourish, requires appreciation and sympathy, to such an extent, at least, that its utterances shall not seem to its audience as if in an unknown tongue.

We have no reason to boast, or to be ashamed of what we have thus far accomplished; it has been but a little while since we have been furnished with the means of investigation needed to give our observations that accuracy and precision which alone can entitle medicine to a place among the sciences properly so called; and we may begin the new century in the hope and belief that to us applies the bright side of the maxim of Cousin, "It is better to have a future than a past."

REVIEWS.

ART. XX.—*The Medical and Surgical History of the War of the Rebellion.* Part II., Volume II. Surgical History. Prepared under the direction of JOSEPH K. BARNES, Surgeon-General United States Army. By GEORGE A. OTIS, Assistant Surgeon United States Army. First issue. Royal quarto, pp. xii., 1024, xx. Washington: Government Printing Office, 1876.

IN the number of this Journal for July, 1873 (pp. 150–173), it was our pleasant task to offer our readers a brief analysis of the first portion of Dr. Otis's gigantic work, and we are now called upon to review his second volume, which is more than one-fifth larger than its predecessor, much more fully and elegantly illustrated, and if possible even more thorough and elaborate in its treatment of the various subjects discussed within its pages.

In Volume I., as will be remembered, after some preliminary matter, the consideration of Special Wounds and Injuries was begun, and continued through five chapters, which dealt respectively with Injuries of the Head, and with those of the Face, Neck, Spine, and Chest. The present volume embraces four chapters, devoted in succession to Injuries of the Abdomen, Injuries of the Pelvis, Flesh Wounds of the Back, and Wounds of the Upper Extremity. Wounds of the Lower Extremity, with various generalities, will be considered in Volume III., which it is expected will conclude the series, and which will contain a copious analytical index to the whole work.

Although, as justly remarked by Dr. Otis, the abdomen and pelvis are contiguous, and constitute in reality but one cavity, yet, in dealing with the vast number of facts furnished by the records of the war, it is convenient to adopt an arbitrary division, and to consider separately the injuries of each region. Accordingly CHAPTER VI. is devoted to the important subject of INJURIES OF THE ABDOMEN, all those organs being regarded as abdominal which lie between the diaphragm and the superior strait of the pelvis.

Contusions and Wounds of the Abdominal Parietes are considered in the First Section, and the value of deep sutures in cases of incised wounds is insisted upon as a means of preventing the subsequent occurrence of ventral hernia. This is a point in regard to which the experience of our army officers has contradicted the doctrines formerly taught by Guthrie and Tripler, and has rather confirmed those of Matthew and Legouest: the quilled suture is particularly commended by Dr. Otis, who mentions that he has by this means twice secured firm cicatrices without protrusion in extensive abdominal wounds of horses. Under the heading of *complications* of parietal wounds, hemorrhage from the epigastric and other arteries is alluded to, and the danger and folly of temporizing in these cases by the use of compression and styptics, forcibly pointed out:—

"The instances to be cited," says Dr. Otis, "teach emphatically that wounds of the epigastric, circumflex, mammary, and lumbar arteries are not to be regarded as trivial, but demand the rigorous application of the rules for the management of wounded arteries, the exposure of the bleeding point, and a proximal and a distal ligature. Schindler and Hesselbach have invented compressors for the epigastric artery, and the practitioner will find propositions in the books for compression by bougies introduced into the wound, or by raising a fold of the soft parts, and recommendations of the ever-ready styptics; but all such means should be rejected by those who would practise sound surgery."

Several instances of the lodgment of foreign bodies in the abdominal walls are narrated, and exception is taken to Guthrie's rule that no search for balls should ordinarily be in such cases undertaken. As pointed out by Dr. Otis, foreign bodies seldom become encysted in the abdominal parietes, where their movement is facilitated by the action of the muscles, while their retention subjects the patient to the constant risk of suppuration occurring in dangerous proximity to the peritoneum.

Visceral Injuries without External Wounds form the subject of the Second Section, which is one of much interest to practical surgeons. In no instance during the war was sudden death attributed to a blow upon the abdomen unattended with organic lesion, and Dr. Otis considers Mr. Pollock and Mr. Bryant justified in their scepticism as to the possibility of such an occurrence. No case also appears to have been met with of fatal laceration of a large *bloodvessel* without the presence of an external wound, but reference is made to an example of rupture of the aorta recorded by Legouest, to three of rupture of the vena cava cited by Velpeau, and to one of rupture of the splenic vein, quoted by Prof. Gross. In the *Transactions of the Philadelphia Pathological Society* (vol. v. p. 107), will be found a case, reported by the present writer, of rupture of the external iliac artery, proving fatal on the twelfth day. Ruptures of the *liver* are represented by five cases; ruptures of the *spleen* by three, and ruptures of the *kidney* by four; two of the latter, however, lacking post-mortem proof of correct diagnosis, as the patients recovered. No examples were specifically reported of rupture of the stomach, gall-bladder or duct, ureter, pancreas, or suprarenal capsules, but as thirty-one cases were recorded simply as laceration of the viscera, without particular mention of the organs implicated, it is quite probable that some of these rare lesions actually occurred. The same may be said in regard to rupture of the omentum[1] and mesentery, and of the diaphragm. Rupture of the *intestines* was specifically noted in five cases, the appearance of the injured bowel in one instance being well represented in a photographic plate executed by the "Woodbury process."

The Third Section deals with the important subject of *Penetrating Wounds of the Abdomen*, and will we doubt not excite a good deal of comment, and probably no little criticism, from surgical writers—the author, from his study of the records of the war, having been led to recommend much more heroic measures in the management of these cases than are ordinarily considered advisable. We shall endeavour fairly to present the evidence adduced by Dr. Otis in support of his views, so that our readers may judge for themselves of the soundness of his conclusions. *Simple penetrations and perforations without injury to the viscera*, are first considered, this category embracing nine cases of bayonet wound, of which six terminated in recovery, one of sword thrust, several of knife wound, and one of arrow wound, all of which likewise ended favourably. A number

[1] A case of fatal rupture of the gastro-colic omentum was reported by the reviewer in the Proceedings of the Philadelphia Pathological Society, vol. ii. p. 117.

of cases were also reported in which simple penetration was supposed to have been due to gunshot injury, and in a few instances the diagnosis was confirmed by the protrusion of unwounded viscera (the patients recovering), or by post-mortem examination. In some cases also balls were voided in defecation after considerable intervals, thus rendering it probable that they gained access to the bowels through consecutive ulceration, rather than by direct injury at the time the wounds were inflicted. Upon the whole, however, Dr. Otis seems justified in his conclusion—

"That really *simple penetrating wounds* of the abdominal cavity, that is, penetrations or perforations without visceral lesion, are very rarely inflicted, either by sharp or blunt weapons, or by shot; and that most of the apparent exceptions are explicable by one or the other of two conditions: either that the true course of the weapon or projectile evades the cavity it apparently enters; or else, traversing the cavity, is really associated with injuries of the viscera, with lesions usually unattended by extravasation, and susceptible of repair."

Wounds of the Stomach next occupy Dr. Otis's attention, and he judiciously points out the indefiniteness of most of the symptoms which are commonly supposed to indicate that this organ has been wounded, and expresses the opinion that, apart from ocular evidence, or that derived from the introduction of the educated finger, extravasation of the contents of the stomach is the only pathognomonic sign of the division of its walls. We suppose that Dr. Otis would include under the heading "ocular evidence," the discovery of *shot* in the matters vomited immediately after the injury, as was observed in a case reported some years since by Dr. H. Culbertson, of Zanesville, Ohio. Several fatal cases of punctured or incised wound of the stomach were registered during the war, and a remakable example has since been placed on record in which gastroraphy was unavailingly resorted to by Assistant Surgeon Bentley; two cases of recovery from similar injuries have likewise been reported, but we infer from the reticent manner in which they are referred to that neither is considered unquestionable. Gunshot wounds of the stomach form a large group, and one of which the mortality appears to have been very great; though nineteen alleged instances of recovery are quoted, only one is considered by Dr. Otis to be certainly authentic.

"The observations of the war on this subject may be summed up as embracing four fatal punctured or incised wounds, one incontestable recovery from a shot perforation, a few recoveries from shot wounds in the gastric region, in which the diagnoses were not determined unequivocally, and nearly sixty fatal cases of more or less complicated shot wounds of the stomach."

In three cases, patients survived for some weeks with gastric fistulæ, which, however, were believed to have been caused by consecutive ulceration rather than by direct wound of the stomach. Gastrotomy was not resorted to in any case, nor was gastroraphy, the instance of the latter operation already referred to as having been reported by Surgeon Bentley, having occurred since the termination of the war. In a very interesting note, Dr. Otis has investigated the literature of gastrotomy (for the removal of foreign bodies), which operation he finds has certainly been successfully employed in six cases, less surely in five more, and unsuccessfully in one. To these must be added the successful case of M. Labbé, which has recently attracted so much attention in Paris (*l'homme à la fourchette*). Of the analogous operation for obstruction of the œsophagus (which with Dr. Otis's permission we must still venture to call *gastrostomy*), seventeen fatal cases are referred to, a number which has since

been increased to twenty-five;[1] the success in the one set of cases is almost as uniform as the want of success in the other.

Wounds of the Small Intestines are justly considered by Dr. Otis as among the most important, as they are certainly the most fatal, complications of penetrating wounds of the abdomen. *Punctured and incised* wounds were uncommon, and mostly resulted from stabs inflicted in private brawls. Only a few sabre or bayonet wounds of the small intestine came under treatment, though a number were observed on the bodies found on the battle field. In none of the cases received into hospital was there visceral protrusion, and all seem to have terminated fatally from fecal extravasation and consequent peritonitis. Enteroraphy was not resorted to in any of these cases, but has since the war been successfully employed in two out of five instances in which it has been practised.

Gunshot wounds of the small intestine were of comparatively common occurrence, and five cases of recovery were reported by competent observers, though, post-mortem confirmation of the diagnoses being of course wanting, it is, as pointed out by Dr. Otis, not conclusively established that the injured parts were not in the large rather than in the small intestines. Wounds of the duodenum were observed in three fatal cases, while wounds of both jejunum and ileum were very frequent, and in a large number of instances[2] more than one convolution of intestine was wounded by the same ball; a circumstance which must be remembered in considering the use of sutures in these cases. A peculiarity of gunshot wounds of the bowel, upon the importance of which Dr. Otis properly insists, is that the lesion is more extensive in the muscular and mucous coats than in the serous, a state of things which obviously favours the reparative process in these injuries. Protrusion of the bowel is very rare in cases of gunshot wound, whether the gut itself is or is not injured; three cases are however reported, in which protrusion of wounded bowel occurred, and in two of which *enteroraphy* was practised, though unfortunately without benefit. In the first of these cases, three wounds had been sewed up in the protruding portion, but after the patient's death, which occurred twenty-four hours later, two additional wounds were found the existence of which had not been suspected; there had, however, been no fecal extravasation, the fatal result being due apparently to commencing gangrene of the bowel with incipient peritonitis.

Wounds of the large intestine are much less serious than those of the smaller bowel, a fact which is amply accounted for by the different anatomical relations of the parts. *Punctured and incised wounds* were noted in four cases, two ending in recovery and two in death, one of the latter after enteroraphy. *Gunshot wounds* of the transverse colon were more serious than those of either the ascending or the descending portion, only one recovery being noted in the former category, as compared with thirty-two and twenty-six in the two latter respectively. Of the whole fifty-nine patients, forty-one are known to be still living, four to have subsequently died (fecal fistulæ persisting to the last), and fourteen have not been recently heard from, though their wounds were firmly healed

[1] Sydney Jones has operated three times, and Sédillot and Forster each twice, while single cases have been reported by Fenger, Curling, Durham, Vonthaden, Lowe, Maury, T. Smith, MacCormac, Clark, Troup, Mason, Bryant, Jackson, Jacobi, Tay, Hjork, Heath, and MacKenzie.

[2] In a foot note, Dr. Otis estimates that the average proportion is between two and three wounds for each shot.

before they passed from observation. Fecal fistulæ still continue in five cases, but in the remainder closed in periods varying from one month to twelve years after the reception of the injuries. In addition to the cases above referred to, there are several in which recovery was obtained, the balls being voided at stool; but in most of these the bowel was probably not wounded in the first place, but penetrated secondarily by the process of ulceration. An important difference, insisted on by Dr. Otis, between the condition of abnormal anus which results from gunshot wound, and that which follows neglected strangulated hernia, is that in the former the septum, spur, or *éperon*, which separates the contiguous portions of gut, is commonly absent; hence the greater probability of spontaneous closure in the fistulæ which result from gunshot injury. When the septum exists, Dr. Otis judiciously advises that a thorough trial should be given to Desault's plan of treatment by compression, before resorting to the use of Dupuytren's enterotome or any of its numerous modifications.

Dr. Otis's remarks upon the subject of *Enteroraphy* constitute the portion of his book which will probably excite most controversy, and that we may run no risk of misrepresenting his views upon this important topic, we shall, as far as possible, quote what he has said upon the subject in his own words. We would, however, first call attention to the admirable historical sketch which he gives of the practice of applying sutures in intestinal lesions, and to his clear description, illustrated by numerous wood-cuts, of the various forms of stitch recommended by authors. Those which are particularly, and we think rightly, approved by Dr. Otis, are the forms of suture respectively introduced by Lembert and by Gély. Upon the subject of enteroraphy in general, Dr. Otis says:—

"From the evidence presented in the preceding pages, it may fairly be inferred that in all punctured and incised wounds of the intestinal canal attended with protrusion, the safest practice consists in closing the intestinal wound by suture, and reducing the protruded viscus, unless its structure is irretrievably disorganized and the adoption of the alternative of establishing a preternatural anus is compulsory. It is highly probable that in the rare instances in which shot lacerations of the intestine are attended by protrusion, a like practice is applicable. In stabs and shot wounds implicating the small intestine, unattended by protrusion, the common practice has been to seek to avert extravasation into the peritoneal cavity by arresting peristaltic action by opium, and by enjoining absolute quiet, and to indulge the hope that adhesions may form through the efforts of nature. Experience teaches that, in the vast majority of instances, such hopes are illusory. Nine times in ten, or oftener, extravasation takes place, and hyperacute peritonitis ensues, and generally proves fatal within forty-eight hours. When the patient rallies from the faintness and depression immediately following the wound, there is almost always tension and tenderness of the belly; then, in John Bell's graphic language, come on dreadful pain and vomiting, costiveness, hiccough, the torments of the *miserere mei*, and the patient in a great anguish expires. Or else, after the intense pain, there may be an interval of deceitful ease, which is merely a sign of gangrene, and the patient sinks into a low muttering delirium and dies. Guthrie justly declares that 'the do-nothing system is generally followed by death.' I have shown that in wounds of the small intestines of any magnitude, the pathological evidence of recoveries achieved by the unaided efforts of nature, even through the establishment of a preternatural anus, is limited to a very few instances, of which none are absolutely unequivocal. Therefore, in wounds of this viscus, unattended by protrusion, when there is danger of extravasation, the external wound should be enlarged, and the wound in the intestine closed by suture. Wounds of the large intestines often do well without interference, and, in these wounds, enteroraphy will seldom be requisite unless the wounded colon protrudes. Yet there are exceptional cases, in which extending the

external wound, and sewing up the rent in the gut, is the best and only means of preventing extravasation, as is well exemplified by the successful case of enteroraphy, for shot laceration of the colon, recorded by Baudens."

We suppose that there can be no diversity of opinion as to the propriety of applying sutures in cases of wounded intestine accompanied by protrusion. Here, unless the wound be so large as to render it necessary to establish an artificial anus (as was successfully done by Larrey, in a case of gunshot wound of the ileum), there can be no question that it is the surgeon's duty to close the intestinal wound by sutures, and then to return the gut within the abdominal cavity. But in cases of wound unattended with protrusion, the course to be pursued is not so clear. Non-interference is undoubtedly the practice which is approved by the majority of surgeons, though Dr. Otis is able to adduce the names of several high authorities in favour of a different course. Among these may be particularly mentioned the names of Legouest, Baudens, Pirogoff, Lohmeyer, and Beck, in Europe; and in our own country, those of Drs. Hewitt, McGuire, Lincoln, and Billings. Prof. Gross, while condemning exploratory incisions and enteroraphy in cases of gunshot injury unattended with protrusion, favours their employment in cases of punctured or incised wounds.

We feel compelled to say, though we do it with great hesitation, that, after a careful examination of all the evidence brought forward by Dr. Otis, it does not seem to us that he has established the correctness of his doctrine. He has collected in all nine cases of enteroraphy for gunshot wound, of which one was completely successful, three ended in recovery with fecal fistula, and five proved fatal. But in studying these cases more closely, it appears that in four of them, viz., Larrey's (already referred to), Gissing's Bentley's, and Judson's—including two of the four recoveries—the gut protruded, and that hence these have no bearing upon the point at issue. A fifth case, the third of recovery, was one in which Dr. Kinloch,[1] *seven months* after the reception of the injury, the patient having survived an attack of traumatic peritonitis, laid open the abdominal cavity, and, cutting away a portion of the wounded bowel, endeavoured by the use of sutures to restore the continuity of the remainder, the sutures giving way on the third day, and the patient, though gaining greatly in health, having still a fistula remaining when last heard from. This was undoubtedly a very remarkable case, and one which reflected the highest credit upon the skill and intrepidity of the operator, but we are not sure that it might not be as plausibly quoted in support of the doctrine of non-interference as in favour of the use of sutures. There remain, then, but four cases, viz., two of Baudens's, one of Pirogoff's, and one of Gill's. Of these, but one survived (Baudens's second case), and it was an instance of wound of the large intestine (transverse colon), and might not improbably have terminated equally well without interference.

That gunshot wounds of the small intestine usually prove fatal under the expectant mode of treatment is unfortunately but too certain. Dr. Otis has himself, however, recorded five cases of recovery, which occurred during our war, and which were regarded by the competent surgeons, under whose care they fell, as instances of wound of the lesser bowel, while the only example which he has been able to find of recovery after enteroraphy of the unprotruded small intestine, is Dr. Kinloch's case, which, as we have already remarked, the patient having survived his injury seven months

[1] See No. of this Journal for July, 1867, p. 105.

before operative measures were resorted to, might not unreasonably be looked upon as itself a triumph of expectancy. Looking at the matter practically, what would Dr. Otis have had the surgeons do, under whose care the five cases already referred to were treated? Should they, confiding in the accuracy of their diagnosis, and relying upon Dr. Otis's advice, that in lesions of the small intestine "unattended by protrusion, when there is danger of extravasation, the external wound should be enlarged, and the wound in the intestine closed by suture," should they, we say, have laid open their patients' bellies and sewed up the wounded bowels? Had they done so, some of them might perhaps have furnished additional illustrations of the obscurity of this class of lesions and of the impossibility of distinguishing wounds of the small from those of the large intestine; but does any one believe that they would, all five, have succeeded in saving their patients?

That a doubtful remedy is better than none, is, no doubt, a maxim of wide application, but we would couple it with another, that, if the surgeon can do no good, let him at least do no harm. In the presence of a penetrating wound of the abdomen, it must be remembered that there is, in the first place, at least a possibility that the bowel has escaped injury altogether; then, that if the wound has actually involved the intestine, unless the gut has protruded (when the propriety of using sutures is unquestioned), there is no means of being absolutely certain that it is the small and not the large intestine that is affected, and that in the latter case at least fifty-one recoveries by expectant measures, in our war alone, are to be balanced against a single successful operation (Baudens's) in a case in which fecal matter escaped from the wound, and which might therefore have recovered without interference; while if the wound is in the lesser gut there is no successful case of enteroraphy to be referred to—Kinloch's brilliant operation can be no guide to the surgeon in the management of a recent injury—and in our war alone at least five successes claimed for expectancy by surgeons, the accuracy of whose diagnosis is only rendered doubtful by the fact that their patients recovered.

Speaking for himself, the present writer would say that the only case in which he could consider the exploratory incisions recommended by Dr. Otis as justifiable, would be one in which fecal matter was actually escaping from the external wound; and even in such a case it would be a matter of grave hesitation whether the patient's chance of recovering by the formation of a fecal fistula, without interference, was not greater than the prospect of saving life by laying open the wound and sewing up the apparent intestinal lesion, only perhaps to find fatal extravasation ensue from another wound which had eluded detection.

We beg to repeat that in venturing to differ from Dr. Otis, we do so with extreme hesitation, and with a full appreciation of the great value of his opinion, and of the weight which it will justly carry with it wherever his volume is read.

Wounds of the Liver are next considered. The records of the war furnished but three instances (one fatal) of punctured or incised wounds of this viscus, and Dr. Otis's researches into the annals of surgery have enabled him to refer to only about sixty cases of a similar character, of which twenty-six appear to be authentic examples of recovery. Gunshot wounds of the liver came under treatment in one hundred and seventy-three cases, the hepatic lesion in fifty-nine of these being the sole important injury, while in the remainder it was complicated with fractures of the

ribs or vertebræ, or wounds of other viscera. Twenty-five of the first group, and thirty-seven of the second, terminated favourably; thirty-four of the first and seventy-four of the second ended in death; while the result in three cases could not be ascertained. The most frequent causes of death in the fatal cases were hemorrhage, peritonitis, and, at a later stage, hepatic abscess. The number of alleged recoveries seems suspiciously large, especially when it is found that Dr. Otis's industry has enabled him to glean not more than sixty such cases from other sources; and hence we are not surprised to learn that in thirty of the sixty-two cases the diagnoses appear to have been based upon questionable evidence, and that the number of incontestable recoveries is therefore reduced to thirty-two. One unsuccessful attempt was made to extract a ball from the liver, and in one case a portion of the disorganized viscus was successfully removed by ligature; this and a few similar instances referred to in a foot-note lead Dr. Otis to believe "that this form of *hepatotomy* is not hazardous."

Wounds of the Spleen.—Only one case (fatal) of bayonet wound of the spleen was reported during the war; but an instance of recovery from the effects of a similar injury has been since recorded by Assistant Surgeon Williams. About thirty cases of gunshot wound of the spleen, and two instances of recovery, were reported, though the histories in these cases lack precision; in one of them the spleen was removed by ligature by Dr. Alston, of Texas. Dr. Otis appends a tabular statement of twenty-six cases of splenotomy for all causes; one of these (No. 18, Dorsey's) appears to have slipped in by mistake, as the account in Eve's "Remarkable Cases in Surgery" shows that the spleen was not removed, but, its adhesions having been broken up, was replaced "as nearly as possible in what I [the operator] conceived to be its natural position." To the remaining twenty-five cases may be added six others, since reported by Urbinati, Watson, Markham, Elias, Pietrzycki, and Péan (his second operation), with one mentioned in the *British Medical Journal* for July 8, 1876, and in the present number of this Journal, and, if the reader chooses, still an eighth attributed to Hunter by that somewhat apocryphal authority, the facetious Mr. William Wadd. Of these thirty-two or thirty-three cases, nineteen or twenty, in which the excision was done for traumatic causes, all terminated favourably, while of the thirteen pathological operations, at least seven (more than half) proved fatal.

Wounds of the Pancreas, from gunshot injury, were noted during the war in five cases, of which four proved fatal, one from shock and peritonitis, and three from secondary hemorrhage In the case which terminated favourably, a portion of the pancreas protruded, and was removed by strangulation with a silver wire; this, with three somewhat similar cases cited by Dr. Otis (Kleberg, Laborderie, Caldwell), may form the basis for some future history of *pancreatotomy*, which, when performed for traumatic causes, appears to be an operation attended with very little risk.

Wounds of the Kidney.—There were no instances recorded of punctured or incised wounds of this organ, nor of persistent urinary fistula. Recovery is said to have followed gunshot injury of the kidney in twenty-six cases, several of which, however, are not very satisfactorily reported, while sixty fatal cases are recorded, many of these having been complicated with wounds of other viscera. Neither *nephrotomy* nor *extirpation of the kidney* was attempted during the war. Of the former operation, in its limited meaning of cutting into the kidney (as a remedy for *calculus*), six or seven cases have now been recorded since the publication of the

paper in which Mr. T. Smith urged the revival of the proceeding; but all have, we believe, proved fatal except Durham's and Gunn's cases, in neither of which was any calculus discovered. As a remedy for *hydronephrosis* and *pyonephrosis*, the measure has been much more successful, four out of seven cases of this nature, which the present writer has collected, having terminated favourably. *Extirpation of the kidney* appears to have been performed in fifteen cases, of which nine proved fatal.

Wound of the Supra-renal Capsule was only noted in one instance, and the cases in which the *omentum* or *mesentery*, or abdominal *blood-vessels* were wounded, without other serious complications, were of course very few.

The amount of space already consumed by this review, and the large quantity of material yet remaining to be considered, compel us to pass over much of interest in Dr. Otis's account of the complications of abdominal injuries, and we will terminate our notice of this chapter by quoting briefly from his concluding remarks upon treatment.

"In the general management of wounds of the abdomen, venesection was abandoned, as far as can be learned, in the armies on either side, even more completely than in the treatment of wounds of the chest. There were those who still placed confidence in the controlling power of mercurial preparations over inflammation, and the administration of calomel formed part of the treatment in many cases. Surgeon E. Swift observed several apparently desperate cases of traumatic peritonitis, which terminated favourably under the method commended by the elder Larrey, of inunction with gray ointment after vesication of the entire surface. But in all cases, opium was the main resource. . . . . Apart from the general advantages of this invaluable remedy, in cases of wounds of the abdominal viscera, by arresting peristaltic action, it aided in securing the rest of the wounded part, the first condition in the reparation of all traumatic lesions. Diffuse inflammation once established, however, neither this nor any other remedy was of avail, an experience repeated in the recent Franco-German War. But traumatic peritonitis is often circumscribed, and when localized in immediate proximity with the wound or ball-track, it is unattended by general reaction, and the local reaction may be protective only, not transgressing the plastic stage, and serving simply to establish adhesions which may guard against effusions into the peritoneal cavity. Even when less strictly circumscribed, when effusion has taken place, local traumatic peritonitis may still exert a beneficent protective influence, by encysting the foreign matters extravasated into the peritoneal cavity by plastic exudations. To restrain inflammation within these salutary limits, absolute rest is the most important indication, the patient being suffered neither to be moved nor to move himself; and hence the best contemporaneous surgeons strongly insist that men with penetrating wounds of the abdomen shall be permanently treated as near as practicable to the spot where they fall. . . . . Food and drink, save a little ice or cold water, are to be absolutely interdicted at first, and then the blandest nutriment, such as milk, may be sparingly allowed. . . . . If there is a single wound, the patient should lie in that posture that will place the orifice downwards and favour the approximation and adhesion of the viscera to its edges. If the abdomen is perforated, it will usually be best to make the exit orifice dependent. When there is evidence that a viscus is wounded, the parietal wound must always be left open except in cases in which enteroraphy is practised. No advantageous effects were obtained by local depletion or by emollient fomentations at an early period; but extended and protracted applications of ice over the entire abdomen were believed, in several instances, to have exerted a decided influence in moderating inflammation. The majority of surgeons esteem moderate compression by a circular bandage useful. Dr. Neudörfer regards the gypsum bandage as peculiarly adapted to this class of injuries. If the stomach or small intestines are divided, there is no reasonable presumption that fecal extravasation and consequent

hyperacute generalized peritonitis can be averted unless by operative interference. Under these circumstances, therefore, the surgeon should enlarge the wound, carefully cleanse the cavity, and unite the solution of continuity in the wounded viscus by sutures."

Our reasons for questioning the soundness of the advice given in the last sentence have already been laid before our readers, and need not be repeated.

In CHAPTER VII., which is somewhat longer than its predecessor, Dr. Otis takes up the subject of INJURIES OF THE PELVIS. These, as a class, are much less fatal in their consequences than injuries of the abdomen, the mortality in the latter being in round numbers more than seventy-five, and in the former less than twenty-five per cent. Indeed the careful student of this chapter will, as remarked by Dr. Otis, "be impressed by the severity of the injuries compatible with recovery, that the parts in this region will sustain, rather than by their extreme danger."

Section First deals with *Shot Fractures of the Pelvic Bones*, regarding which an important prognostic mark is mentioned, the gravity of fractures at the wound of entrance being much greater than of those at the wound of exit—a similar rule to that established in the case of the ribs by the observations of Dr. J. H. Brinton, during our war, and more recently of Pirogoff, in the late Franco-German campaign. The whole number of cases of shot fracture of the pelvis reported during our war was 1494, and in 829 of these the *ilium* was known to be implicated, there being besides a large proportion in which the particular bone affected was not specified. The left ilium was more frequently struck than the right, the difference amounting to about twelve per cent. of the number of cases in which the side of the injury was noted. The fatal cases were 211 in number, and in 33 of these the cause of death was pyæmia or septicæmia. Caries and necrosis were very frequent complications in those cases which terminated favourably. In 151 instances, operations of greater or less magnitude were undertaken, these consisting chiefly of extractions of pieces of bone or of bullets, or other foreign bodies. In two cases balls were removed after preliminary trephining, one patient recovering, though imperfectly, and the other dying from pyæmia on the fifteenth day. Altogether, Dr. Otis seems to be amply justified in declaring that—

"Sufficient evidence has been adduced to prove that authors have erred in representing shot fractures of the ilium as being dangerous, and to indicate that the prognosis of Percy should be re-established."[1]

Gunshot fractures of the *pubis* were specifically noted in 86 cases, of which 43, or just one-half, proved fatal. Fourteen were complicated with vesical, and eleven with rectal lesions, and there were besides many cases reported of wound of the bladder or rectum "with fracture of the pelvis," without indication of the special bone involved. In one very interesting case of complete recovery after shot fracture of the pubis, the presence of a ball was recognized at a depth of eight inches within the pelvis by the use of Nélaton's probe, and the foreign body then removed through a counter-opening.

Gunshot fractures of the *ischium* were represented by 73 cases, of which 31 proved fatal. Vesical and rectal lesions here too proved serious complications, and in many of these cases, as in those of pubic fracture,

[1] "Baron Percy taught that 'Les fractures des os des îles ne sont pas dangereuses.'"

wounds of the genital organs were also observed. Sequestra and foreign bodies were removed in several instances, but no formal excision of the ischium appears to have been attempted.

One hundred and forty-five gunshot fractures of the *sacrum* were reported, the result in three cases being undetermined, and sixty-two of the remainder having proved fatal. Among the instances of recovery were four in which the bladder was penetrated, and eight out of nine cases in which the rectum was wounded, likewise did well. Paralysis ensued in some cases from injury of the neighbouring nerves. Pyæmia was the cause of death in eight cases. Operative measures, consisting chiefly in the extraction of bone fragments or missiles, were adopted in twenty-five cases; in one instance, access to an impacted ball was facilitated by the use of the trephine.

Gunshot fracture of the *coccyx* was noted in seventeen cases, of which six ended fatally; one case was complicated with wound of the rectum alone, and three with wounds of both rectum and bladder; two of the latter being among the fatal cases. Excision of the coccyx does not appear to have been required in any instance.

Section Second is devoted to *Injuries of the Parts contained in the Pelvis.*

"The frequency," says Dr. Otis, "with which active therapeutic measures may be advantageously employed in physical lesions of this region, contrasts strongly with the comparatively rare occasions where such measures can be hopefully employed in injuries of the contents of the other great cavities. . . . In the pelvic cavity . . . only those injuries involving the great bloodvessels and the part of the bladder covered by the peritoneum, are necessarily beyond the resources of art."

After a brief consideration of *Shot Penetrations or Perforations without Visceral Injury*, lesions which appear to be much less infrequent than corresponding wounds of the abdomen, Dr. Otis takes up the subject of *Injuries of the Bladder.* No unequivocal instance of rupture of this organ from external violence was reported, nor were any examples noted of sword, lance, or bayonet wounds of the bladder. Under the heading of *concussion* of the bladder, Dr. Otis refers to the doctrine of Blenkins, Legouest, and Hamilton, that "paralysis of the bladder" may follow shot contusions of the abdominal parietes without direct vesical lesion. We agree with Dr. Otis that the evidence in the case adduced is very unsatisfactory, and can indeed see nothing more in it than a history of sympathetic urinary retention, such as is occasionally observed after injuries of almost all parts of the body. *Shot wounds* of the bladder were reported in 183 cases, of which no less than 87 terminated in more or less complete recovery; it is to be noted, however, that in most of the cases which ended well, the balls entered the bladder from below, wounding the organ therefore in parts uncovered with peritoneum. In a majority of the cases, too, convalescence was retarded by the persistence of urinary fistulæ, and in a few instances pensioners have since the war succumbed to these complications. In a number of cases foreign bodies lodged in the bladder, spiculæ of bone sometimes making their escape by the urethra, but the offending substances usually becoming encrusted with urinary deposits, and necessitating removal by operation.

"The annals of the war, or donations to the museum, furnish twenty-one examples of lithotomy for the removal of concretions consequent on wounds of the bladder. In twelve, these were formed about projectiles from firearms; in

one, about an arrow-head; in three, upon bone-splinters; in three, on inspissated mucus, or blood, or with no recognizable nucleus; in two, respectively, upon a bit of cloth and upon a tuft of hair."

Seventeen of the whole twenty-one cases terminated favourably. The lateral operation is known to have been employed in twelve cases (one fatal), the bilateral in three, the supra-pubic in three (two fatal), and the median in two. In one case neither the form of operation nor the result has been ascertained.

In the management of wounds of the bladder, Dr. Otis, judiciously, as we think, approves Larrey's doctrine that in most cases a catheter should be kept in position during the whole course of treatment. Although a few cases may recover without the use of the catheter, such as that reported by Prof. Van Buren, yet in most instances the use of the instrument is, we believe, justly regarded as an important measure; an exception may, however, be made in those cases in which the ball has entered through the perineum, as in these the wound itself furnishes a sufficient means of drainage in the most favourable position.

Wounds of the Prostate were observed in a few cases, but seldom without other and more serious complications.

Wounds of the Rectum, as the result of gunshot injury, were noted in 103 cases, of which 44 resulted fatally; in 46 cases, concomitant fractures of the pelvic bones were specially reported, and osseous lesions are believed to have existed in many more. The principal causes of death were pelvic cellulitis, septicæmia, diffuse suppuration, and secondary hemorrhage. Thirty-four cases, of which fourteen were fatal, were complicated with wounds of the bladder. In many of the cases of recovery, fecal fistulæ persisted, and in some of these the patients have succumbed since the termination of the war. One remarkable case is referred to, in which an officer was shot through the anus, the ball lodging in the lung, and causing death, without any external wound having even suggested the nature of the injury, which was not suspected during the patient's life. In his comments upon the treatment of rectal wounds, Dr. Otis judiciously urges the importance of Dupuytren's advice that the risk of fecal infiltration should be avoided by free division of the sphincters; this plan was occasionally pursued by our surgeons, and has since been most advantageously employed by Simon, Fischer, and others, in the late Franco-German war.

Fistula in Ano and Hemorrhoids were both quite common affections, particularly the latter, of which over 60,000 cases were reported. Sixty-one operations for fistula, and nineteen for piles, were recorded, all apparently having been successful.

Wounds of the Pelvic Bloodvessels and Nerves were observed in numerous cases. The sciatic artery was twice ligated, single proximal ligatures being employed in both instances, and both cases proving fatal, as did all others in which this vessel was wounded. Bleeding from the gluteal artery was successfully treated in four cases, twice by compression and twice by the proximal ligature, while eleven cases terminated fatally under the former method, and three under the latter; double ligatures were unsuccessfully employed in one case in which bleeding from a branch of the gluteal complicated a gunshot fracture of the pelvis.

"Evidently," says Dr. Otis, "lesions of the gluteal artery and its branches are not insignificant. It is probable that, when the bloodvessels are fairly severed, properly adjusted compression will control bleeding from them in almost all cases; but when an artery the size of the gluteal is but partly divided,

so that it cannot retract and be closed by the natural process of hæmostasis, then the only safe resource is the treatment insisted on by Guthrie, and the practitioner must at all hazards accomplish the difficult operation of placing ligatures on the vessel above and below the seat of injury."

The internal iliac artery was tied three times during the war, but in each case unsuccessfully; the operators were Dr. J. W. Thompson, of Paducah, Ky.; Dr. A. B. Mott, of New York; and Dr. J. C. McKee, U. S. A. In the case operated upon by the last-named surgeon, the common iliac was also tied. In a foot-note, Dr. Otis investigates the statistics of ligation of the internal iliac artery, and no doubt properly excludes the case attributed by Profs. Gross, Erichsen, and Hamilton, to J. K. Rodgers, and by the present writer, by a misprint, to Rogers; in extenuation of his own mistake, the reviewer can only plead that he was misled, as were doubtless the other writers mentioned, by the authority of so accurate an author as the late Dr. G. W. Norris; a renewed search through contemporaneous surgical literature having failed to reveal any record of such an operation, we are forced to conclude that in attributing such a case to Rodgers, Dr. Norris made one of his very few mistakes. After this candid confession of error, we trust that Dr. Otis will forgive our pointing out that he has himself gone astray in tabulating both under this head, and under that of ligation of the common iliac, Syme's famous case in which he employed the old operation "in the person of a seaman R. L——." This case was believed, during the life of the patient, to have been one of ligation of the common iliac and of both its branches, but after his death it was found that the *external* iliac had been the vessel affected, and that all the ligatures had been applied below the bifurcation of the common trunk.[1] Omitting this case, there remain in Dr. Otis's table eighteen, or, if Œverent's operation be counted, nineteen cases, to which may be added five others, since recorded by McLean, Porta, Cianflone, Colluzzi, and Landi, and a sixth (unpublished) referred to by Prof. Van Buren in his report to the late International Medical Congress, as having occurred at Bellevue Hospital, New York. Of the whole twenty-five only seven terminated successfully.

Four[2] cases of ligation of the common iliac artery are said by Dr. Otis to have occurred during the war, the operators having been Dr. Brainard, of Chicago; Dr. McKee, U. S. A.; Dr. Isham, of Chicago; and Dr. Cutter, of Newark, N. J. Dr. Brainard's case was, as regards the operation, successful, the ligature coming away without hemorrhage, and the wound healing, though the patient succumbed to typhoid fever several months later. In his statistical summary, Dr. Otis adds to the thirty-two cases collected by Dr. Stephen Smith, fourteen others, beside the four army cases enumerated above. From these one must be deducted (Syme's case, already referred to); but, on the other hand, twelve more may be added, viz., the operations respectively recorded by Hamilton, Ingram, Hammond, Dugas, Luzenburg, Watson, Barral, D'Almeida, Pitta, Barbosa, Caldas, and Gouley, giving a total of sixty-one cases, of which forty-eight terminated in death.

[1] Medico-Chirurgical Transactions, vol. xlv. p. 387, *Postscript*.

[2] By a private note received from Dr. Otis, while these sheets are passing through the press, we learn that since his volume was printed he has, after repeated searches, discovered a brief record of two other fatal cases of common iliac ligation, the operators having been Prof. F. H. Hamilton, of New York, and Assistant Surgeon Alexander Ingram, U. S. A.

Wounds of the large veins and nerves of the pelvis are the subject of some valuable remarks by Dr. Otis, but the space already consumed warns us to pass on to the consideration of other topics.

Section Third is *On Injuries of the Genital Organs.* Incised wounds of the *penis* were noted in many instances, and one case of bayonet wound of this organ was recorded. Fifty-two operations were performed for phimosis, in some cases when complicated with unhealed chancroids, and with the customary ill results. Gunshot wounds of the penis were observed in 309 cases, in 41 of which death followed, usually from other concomitant injuries; amputation of the organ was thought necessary in but very few cases. Of gunshot wounds of the *urethra*, 105 examples are recorded, of which 22 proved fatal. Traumatic stricture was a common sequel in those cases which ended in recovery, while in other instances urethral fistulæ formed serious complications. Dr. Otis properly lays stress upon the importance of free incisions in cases of urinary extravasation, and of the use of the catheter as a means of preventing contraction during convalescence. Several cases of lodgment of foreign bodies in the urethra are given, one being the case of the late President Johnson, who suffered severely upon several occasions from the impaction of calculi. Dr. Otis gives a most interesting account of the various operations and instruments which have been devised by the ingenuity of surgeons for the relief of these conditions.

Organic strictures of the urethra were reported in 2581 cases, and caused eight deaths, and 247 discharges for physical debility. The treatment of stricture is considered at some length by Dr. Otis, who describes and figures all the more important instruments which have been employed in this affection, giving in particular one very interesting plate, on which is represented a group of American inventions, beginning with the early suggestions of Physick, Jameson, and Chew, and ending with the elegant modern instruments devised by Drs. F. N. Otis and Gouley. The advice given as to the treatment of stricture is generally judicious, but we must enter a respectful though firm protest against Dr. Otis's commendation of "forced catheterism." In spite of the "solid authorities" which he adduces in its favour, we cannot but regard it as a cruel and dangerous mode of treatment, and one which it would be well for humanity could it be banished from practice. Urethroraphy and urethroplasty were employed in a few instances, but many pensioners still suffer from urinary fistulæ; these unfortunate persons, Dr. Otis very properly suggests, might be assembled at some point under the auspices of the government, and skilled surgical aid invoked for their relief.

Gunshot wounds of the *testes* were observed in 586 cases, of which 66 ended in death, usually from other complications. In no instance did the shock of the injury prove immediately fatal. In 61 cases, excision of the affected organ was resorted to, with 11 deaths. Both testes were removed in four cases, one of which, however, was not an example of gunshot injury.

"An analysis of the five hundred and eighty-six cases of shot injury of the testis leads to the conclusion that there has been gross exaggeration in the statements heretofore made regarding the influence of such lesions on the *morale* of invalids. A decent aversion to publicity as to their mutilations is the only marked characteristic the editor has observed in the numerous cases brought to his notice."

Gunshot injuries of the *spermatic cord* were reported in five cases, and in two (one fatal), ligation of the spermatic artery.

Hydrocele was observed in 1586 cases, of which but 27 were submitted to operation; three of these terminated fatally, but apparently from causes unconnected with their surgical treatment. Varicocele occurred in 7270 cases, and in 1415 was considered a cause for discharge from service. Very few cases were treated by operation.

We feel that we run no risk of contradiction in declaring this chapter and its predecessor to be the most valuable contributions to the literature of abdominal and pelvic injuries to be found in any language.

CHAPTER VIII., though occupying only six pages, embraces all the information which Dr. Otis thinks it necessary to give with regard to FLESH WOUNDS OF THE BACK. Numerically important—they constituted about six per cent. of the whole number of wounds received in action—wounds of the back were seldom fatal, unless through the supervention of pyæmia or tetanus, or from badly treated hemorrhage. As the men were often ordered to lie down under artillery fire, severe lacerations of the dorsal regions were not uncommon, and Dr. Otis has given a remarkably fine chromo-lithographic plate to illustrate the appearance of the parts in a case of this nature. Reverdin's plan of skin-grafting is recommended as a means of hastening the cure in these cases, in some of which Dr. Otis tells us the wounds have remained open in the form of healthy granulating surfaces for as long a period as ten years.

CHAPTER IX., the last in the present volume, and occupying by itself nearly six hundred pages, deals with WOUNDS AND INJURIES OF THE UPPER EXTREMITIES. Following his usual plan, Dr. Otis considers under this heading only sword and bayonet, and other incised and punctured wounds, and gunshot injuries, reserving bruises and sprains, burns, scalds, and frost-bites, with dislocations and fractures from other than gunshot wounds, for future study in the Third Surgical Volume.

Section First is devoted to the subject of *Flesh Wounds of the Upper Extremities*, of which more than 50,000 cases were recorded during the war. Bayonet wounds were noted in 69, and other punctured wounds in 44 cases, while there were 80 examples of sabre cut, not involving the bones, and 164 of other incised wounds of this region, several of the wounds not inflicted in battle being followed by profuse bleeding, which required ligation of the brachial artery in two cases, and of the radial and ulnar each in one. Compression was successfully resorted to in one case of wounded radial, but in one or two cases of wounded brachial artery was employed with a fatal result. There were only four deaths among the whole 357 cases, two from neglected arterial bleeding, and two from causes foreign to the injury received.

Gunshot flesh wounds of the upper extremities formed a very large class of cases, in which recovery was often complicated by the occurrence of contraction and rigidity of the joints, and of atrophy and deformity from sloughing. Many cases proved fatal through the development of pyæmia, and in a large number serious bleeding required the deligation of one or other of the main arteries of the limb. Thus to this group belong four examples of ligation of the subclavian (all fatal), fifteen of the axillary (twelve fatal), seventy-six of the brachial (twenty-one fatal), ten of the ulnar (three fatal), twenty of the radial (four fatal), one (fatal) of the interosseous, besides one of the superficial palmar arch, and several of smaller branches. Compression and styptics were employed in a number of instances, sometimes with success, but more often with disastrous failure; we find nothing in the record here presented to invalidate the sound-

ness of Guthrie's time-honored rules for the treatment of arterial hemorrhage.

Wounds of large nerves were reported in many instances, but Dr. Otis passes over them rapidly, for the reason that the subject of gunshot nerve injuries has been so thoroughly studied by Dr. S. Weir Mitchell and his colleagues, whose opportunities for observation in the Christian Street Hospital were unrivalled. Neurotomy was practised in one case without benefit, and Dr. Otis remarks, very justly, as it seems to us, that—

"Notwithstanding recent experiments, this appears a surgical resource to be entrusted only to practitioners possessing more than ordinary physiological knowledge."

In a considerable number of cases, amputation was required, usually for hemorrhage or on account of gangrene. There were fourteen cases of amputation at the shoulder, belonging to this category, with eight deaths; fifty-four cases of amputation of the upper arm, with twenty-seven deaths; and fourteen cases of amputation of the forearm, with three deaths.

Section Second treats of *Fractures of the Clavicle and Scapula*, including those from gunshot injury and a few which resulted from bayonet or sabre wounds, fractures from causes incident to civil as well as to military life being as usual reserved for a future chapter. There was one bayonet fracture of the clavicle, and there were four sabre cuts and two bayonet perforations of the scapula, but gunshot injuries of these bones were very numerous, there being no less than 2280 cases recorded in which one or both were involved. The *clavicle* alone was fractured in 527 cases, of which 44 proved fatal, a mortality of but a little over eight per cent.; more than half of the patients were returned to duty, but it is probable, as remarked by Dr. Otis, that in many of these cases the bone was simply grooved or chipped and not completely broken through. *Excision of the clavicle* was practised in a number of instances, Dr. Otis's list giving two examples of total extirpation (both fatal), five of partial excision in cases in which projectiles had entered the thorax, and thirty-one of partial excision for uncomplicated gunshot injury. In foot-notes, Dr. Otis has also collected from various sources thirty cases of complete extirpation, and thirty-eight of partial excision of the clavicle. The thirty-one uncomplicated army cases furnished six deaths and fifteen discharges for disability. We quite agree with Dr. Otis's conclusion—

"That extirpation of the clavicle for shot injury is seldom if ever called for; that, as in shot fractures of other long bones, detached splinters should always be immediately extracted, and that, as elsewhere, necrosed osseous fragments should invariably be removed at the earliest practical moment."

Gunshot fractures of the *scapula* alone were noted in 1444 cases, in 1423 of which the results are known. The fatal cases numbered 177, giving thus a death-rate of over twelve per cent. In twelve instances *both* scapulæ were broken without penetration of the chest, and in most of these cases the spinous processes of the upper dorsal vertebræ were likewise fractured. In one melancholy case styptics were unavailingly employed to arrest repeated hemorrhages, and the attending surgeon then bethought him of amputating at the shoulder-joint as a preliminary to the radical measure of extirpating the scapula; but the preliminary operation by itself proved too much for the unfortunate patient, who quickly died before the ingenious operator had time to carry out the proposed treatment. No instance of complete *extirpation* of the scapula was recorded during

the war, but such a case has since occurred to Prof. F. H. Hamilton, being "a solitary example of a successful extirpation for the results of shot injury of the scapula with preservation of the upper extremity." *Partial excisions* were represented by forty-nine cases, more or less deserving the name, of which thirteen were fatal. There were also ten cases of partial excision of both clavicle and scapula, two of the cases ending in death.

In a foot-note Dr. Otis refers to the statistics of scapular extirpation, quoting Dr. Stephen Rogers's table of twenty-five cases (in which, however, he points out that the cases attributed to Gætani Bey and Larrey are identical, thus reducing the number to twenty-four), and adding seventeen additional instances, including Prof. Hamilton's case already referred to, and thus giving a total of forty-one.[1] Of these several were examples of simultaneous removal of the scapula and upper extremity, and, therefore, in our judgment, more properly to be regarded as *amputations above the shoulder* than as *excisions;* others again are instances of extirpation of the scapula subsequent to previous amputation at the shoulder, and should, we think, be classified separately from cases of scapular excision in which the arm is preserved.

We would offer the following as a list containing, we believe, all the cases hitherto recorded of *extirpation of the entire scapula, the arm being preserved;* the case attributed to Dr. Crawford, of Ayr, is rejected by Dr. Otis for want of sufficient details: twenty-eight cases; twenty-one recoveries; five deaths; two not terminated; the operators were Langenbeck, Syme (two cases), Heyfelder, Jones, Hammer, Schuh, Michaux, Hamilton, Rogers, Pollock, Steele, Esmarch, Schuppert, Michel, Spence (two cases), King, Logan, O'Grady, Schneider, Wood, Omboni, MacCormac, Pirrie, Bird, Crawford, and an anonymous case numbered (5) in Dr. Otis's table.

Extirpation of the scapula, subsequent to amputation of the upper extremity, appears to have been performed in eleven cases, with six recoveries, one doing well when the report closed, and four deaths, two of the latter, however, from a recurrence of malignant disease after considerable intervals of time; the case attributed by Dr. Stephen Rogers and by Dr. Otis to the elder Crosby must, on the authority of Dr. A. B. Crosby, be transferred to the list of amputations above the shoulder, both the scapula and the upper extremity having been removed on the same occasion; the operators in the eleven cases in this category were Mussey, Rigaud, Fergusson, Buck, Langenbeck, Busch, Krakowizer, Stimson, Jeaffreson, Soupart, and Deroubaix.

Amputation above the shoulder (the arm, with part or all of the scapula, and sometimes part of the clavicle, being removed at one operation) appears to have been performed in thirty-six cases (including seven done during the war, and hereafter referred to), of which twenty-seven recovered and nine ended fatally; the operators, in other than the army cases, were Cuming, Crosby, Gætani Bey, Twitchell, McClellan, Mussey, Lewis, Gilbert, Niepce, Syme, Fergusson (two cases), Buchanan, Jackson, McLeod, Watson, Charles, Young, Wishaw, Jessup, Esmarch, Parise (three cases), Hendry, Fayrer, Langenbeck, Hamilton, and one of the surgeons of the Pennsylvania Hospital.

We think our readers will agree with us that the record of these operations is almost too favourable to be unhesitatingly accepted; and

[1] Another case is attributed to Dr. Dysort, a Confederate surgeon, but the record is too imperfect to be of value.

we cannot resist a lingering suspicion that some operators have neglected to report their fatal cases.

Fifty-nine cases of partial excision of the scapula (in ten, portions of the clavicle having also been removed) were recorded during the war, and furnished forty-four recoveries and fifteen deaths; adding to these the thirty cases tabulated by Dr. Stephen Rogers, and four since reported by Boeckel and Fischer, we have a total of ninety-three cases, with sixty-four recoveries and twenty-nine deaths. These statistics show that, upon the whole, total is at least as successful as partial excision of the scapula; and that, therefore, in cases of malignant disease, the surgeon should not hesitate to prefer the more sweeping operation. In other cases, partial excision is for obvious reasons a more desirable measure, when the surgeon has the opportunity to choose between the two; and we are quite prepared, in the case of gunshot wounds, to approve Dr. Otis's conclusion, that—

"Although, as in shot comminutions of other flat bones, operative interference may occasionally be demanded, yet, weighing all the evidence, it is obvious that extensive excisions of the scapula for injury can seldom be required as primary operations."

Wounds of the shoulder-joint are considered in Section Third. There were only 72 cases recorded of wound of the joint without bone injury, while there were 1328 cases complicated with fracture of the articulating extremities of either the humerus or the scapula. In round numbers, excision was adopted in about half of these cases, amputation in an eighth, and expectant measures in the remainder. Amputation and excision were, however, also resorted to in many cases in which the shoulder-joint was not immediately involved. The seventy-two cases of joint wound without fracture were all treated without operation, and only six ended fatally; anchylosis occurred in more than half of the survivors.

Expectant measures were employed in 505 cases of gunshot fracture, with 139 deaths, a mortality of 27.5 per cent. These figures certainly show a very favourable result, but Dr. Otis judiciously warns the reader against too hasty a conclusion adverse to operative interference; apart from the fact that the least serious cases were, of course, chosen for expectant treatment, in some the precision of diagnosis may be questioned, and in others such incisions and extractions of sequestra were made as were almost equivalent to excisions.

"The question of the safety and comparative advantages of attempting expectant treatment, after shot fractures of the articular extremities of the humerus and scapula, requires further investigation. It is proved that, under judicious management, the results of expectant measures as to life and limb may be most satisfactory. It remains to be shown that, under the ordinary conditions of war-surgery, immediate operative interference may not be the safest plan. While the opinion offered in my preliminary report of 1865 may have been expressed too emphatically, as deduced from insufficient data, it may still be held that the proportion of cases of shot fracture at the shoulder in which an expectant treatment is expedient, is comparatively small, and that recourse should generally be had to excision, unless concomitant injuries of the bloodvessels or nerves, or extended lesions of the soft parts, or of the shaft of the humerus, render amputation imperative."

Excisions at the shoulder were reported in 885 cases, the results having been determined in all but nine. In 670, with 223 deaths (33.58 per cent.), the operations were performed for direct injury of the articulation, and in 215, with 83 deaths (39.15 per cent.), for shot fracture in

close proximity to the joint, or for consecutive caries or necrosis. In 42 cases, the head of the humerus and portions of the clavicle or scapula were excised, twenty primary operations giving two deaths (the result in one case not ascertained), eleven intermediate operations giving six deaths, and ten secondary operations giving two deaths; there were therefore ten deaths in the whole forty-two cases. Partial excision of the head of the humerus was done in 14 cases, with one death, and complete decapitation of the bone in 273 cases—175 being primary operations, with 56 deaths (32 per cent.); 55 intermediate operations, with 34 deaths (61.8 per cent.); 26 secondary operations, with 13 deaths (50 per cent.); and 17 operations of uncertain date, with one undetermined case, and four deaths (25 per cent.). The head of the humerus and portions of the shaft were excised in 517 cases, of which 293 were examples of primary operation, with 80 deaths (27.3 per cent.); 155 of intermediate operation, with 64 deaths (41.3 per cent.); 50 of secondary operation, with 12 deaths (24 per cent.); and 19 of operation of uncertain date, with two deaths (10.5 per cent.). There were, moreover, 39 cases, with 29 deaths, in which excisions were performed at the shoulder, but in which the parts removed were not definitely specified. Taking all the cases together, the death-rate in the examples of primary excision was 31.06 per cent., in the intermediate cases 46.4 per cent., and in the secondary cases 29.3 per cent. The operations of uncertain date gave a mortality of 31.1 per cent.

Beside the cases of excision represented by the preceding figures, Dr. Otis tabulates 201 cases derived from the records of the Confederate army; the results are definitely ascertained in only 75 of these (32 recoveries, 43 deaths), so that their mortality cannot be fairly estimated.

In only 14 of the whole 1086 cases of excision reported from both armies, was consecutive amputation required; eight of these cases terminated favourably, and six in death.

Amputation at the shoulder-joint was performed in 866 cases, 14 of these operations having been for complicated injuries of the soft parts (*vide supra*). Of the remaining 852 cases, 499 were examples of primary amputation, with 14 undetermined cases, and 117 deaths (24.1 per cent.); 157 being intermediate, with 72 deaths (45.8 per cent.); 66 secondary, with 19 deaths (28.7 per cent.); and 130 of uncertain date, with 11 undetermined cases, and 28 deaths (23.5 per cent.). In six of the successful, and one of the unsuccessful, primary cases, portions of the clavicle or scapula were removed at the time of the operation, so that these might be properly called amputations above the shoulder. Taking together all the examples of shoulder-joint amputation reported during the war, the death rate in determined cases was 29.1 per cent.

"The facts that have been adduced in this section," says Dr. Otis, "appear fully to warrant the conclusions: 1. That in slight shot injuries of the shoulder-joint an expectant conservative treatment is justifiable. 2. If a ball is impacted in the head of the bone, or if the epiphysis is much comminuted, unless there is injury to the bloodvessels and nerves, or very grave injury of the other soft parts, primary excision should be practised. 3. Concomitant fractures of the acromial end of the clavicle, or of the neck or processes of the scapula, or of the upper third of the shaft of the humerus, do not necessarily contraindicate excisions at the shoulder. 4. Intermediary excisions should seldom or never be practised. If, in an attempt at expectant conservative treatment, intense suppurative inflammation arises, it should be combated by free incisions, drainage, emollient applications, etc., and every endeavour should be made to avoid

inflicting another wound upon the inflamed medullary tissue, and to await the secondary stage, before undertaking operative interference. 5. The after-treatment of securing comparative immobility and support of the limb and efficient drainage of the wound, and the ulterior after-treatment of judicious passive and active movements of the arm, are of essential importance in restoring the functions of the member. 6. Primary exarticulation of the arm at the shoulder is imperative in cases of shot lesions of the upper extremity of the humerus attended by injury of the axillary vessels and nerves, or by very grave injuries of the other soft parts in the vicinity of the joint; and may also be demanded when fractures of the humerus involving the shoulder are conjoined with severe injuries lower down in the limb. Circumstances may also justify primary ablation of the arm when there is little injury to the soft parts, and the epiphysis is untouched, if the humerus be so extensively shattered downward as to forbid excision, and fissures extend so near the joint that the section of the bone in its continuity cannot be practised without danger of arthritis. Intermediary exarticulation at the shoulder may be required in cases of hemorrhage, gangrene, or osteomyelitis; and secondary exarticulations for the same causes, and also for complete necrosis of the humerus."

Injuries of the shaft of the humerus form the subject of Section Fourth, which deals with no less than 8245 cases, exclusive of shot fractures involving the shoulder or elbow. In 357 cases, the results have not been ascertained, but the remaining 7888 furnish a large body of statistics for study. *Expectant measures* were employed in 3005 cases, the results in 45 of which were undetermined, and which gave 451 deaths, a mortality of 15.2 per cent. This category embraced a very few cases of gunshot contusion, and more of partial shot fracture of the humerus, with very many examples of complete fracture of every grade of severity. In numerous instances large sequestra were extracted, and yet pseudarthrosis very seldom ensued.

Excision in the continuity of the humerus was performed in 696 cases, though, as justly pointed out by Dr. Otis, many of these might probably with more propriety have been reported as examples of extraction of fragments. In 64 cases amputation was subsequently required, 49 times in the continuity of the bone, with 16 deaths, and 15 times at the shoulder-joint, with 11 deaths. The primary excisions numbered 487, the results in 16 being undetermined, and the fatal cases amounting to 145, thus giving a death-rate of 29.7 per cent. Intermediate excision was practised in 93 cases, with 29 deaths, a mortality of 31.1 per cent. There were 41 secondary excisions, of which only six proved fatal, a mortality of 14.6 per cent.; and 75 in which the interval between the time of injury and that of operation could not be ascertained, with 12 undetermined and 12 fatal cases, a mortality of 16 per cent. Of the whole 696 cases, 191 proved fatal, giving a death-rate for determined cases of 28.5 per cent. In the 477 cases of ascertained recovery, there were 99 in which "no bony union" was reported, and 65 recorded as examples of false-joint; moreover 37 of the successful cases were only saved by subsequent amputation, an operation which failed in 27 other instances.

"Such evidence warrants the assertion that early excisions in the continuity of the humerus after injury can seldom be justifiable, a conclusion at which European surgeons had already arrived from the experience of the Schleswig-Holstein and Danish wars, and which has been confirmed by more recent observations. . . . . Examination of the details of many of the formal primary excisions in the shaft strengthens the impression that they were, for the most part, unnecessary and injurious."

Amputation of the arm for shot injury was practised in 5456 cases, 54

of these having been on account of complicated flesh wounds, 3685 on account of fractures limited to the shaft of the humerus, and 1717 on account of injuries involving the elbow or forearm. The results were ascertained in all but 183 of the whole number of cases, the deaths amounting to 1246, thus giving a mortality of 23.6 per cent. There were 3259 primary operations, with 602 deaths, or 18.4 per cent.; 902 intermediate operations, with 302 deaths, or 33.4 per cent.; 411 secondary operations, with 114 deaths, or 27.7 per cent.; and 884 operations of uncertain date, with 183 undetermined cases, and 228 deaths, or 25.7 per cent. These figures, as will be seen, fully confirm the accepted doctrine that primary amputations are the most, and intermediate amputations the least, successful.

The upper third of the arm was the seat of operation in 1952 cases, with 12 unascertained results, and 358 deaths, or 18.3 per cent.; the middle third in 1739 cases, with 9 unascertained results, and 284 deaths, or 16.3 per cent.; the lower third in 758 cases, with two undetermined results, and 197 deaths, or 25.9 per cent.; while the precise seat of operation was not reported in 1007 cases, with 160 unascertained results, and 407 deaths, or 40.4 per cent. The greater mortality which followed amputation in the *lower third* of the arm, as compared with other situations, has been observed in other campaigns; but has not, according to Dr. Otis, as yet been satisfactorily accounted for. As was the case with excisions of the shoulder, amputation on the left side was somewhat more successful than on the right; can this be explained by the worse effect on the *morale* of the soldier of loss of the right arm? It is a common remark of men severely injured in the left arm, that "it is lucky it is not the right." Among the important complications of amputation of the upper arm, were three ligations of the subclavian artery, with others of the axillary and brachial; consideration of these is reserved for a future chapter on Hemorrhage.

The unfavourable results of excision in the continuity of the humerus, which have already been adverted to, would seem to limit the surgeon in most cases of gunshot fracture to a choice between amputation and expectant measures. When the latter mode of treatment is determined upon, the most important point, after the removal of foreign bodies and loose fragments, and the suppression of hemorrhage, is to secure immobility of the limb without injurious circular constriction. This may be best accomplished, as pointed out by Dr. Otis, by securing the arm to the chest, interposing a suitable pad or cushion, such as that devised by Dr. Stromeyer, and which that eminent surgeon assured Mr. MacCormac he considered "the most valuable appliance he had invented during his life." The present writer may be permitted to mention that, taught by the late Dr. George W. Norris, he has for many years been in the habit of similarly treating, and with the best results, almost all fractures of the upper part of the humerus, whether simple or compound.

In Section Fifth are considered *Wounds and Injuries of the Elbow-joint. Bayonet and sabre wounds* were reported in a few instances, three of the former and six of the latter: all were successfully treated by expectant measures, but in several of the cases Dr. Otis regards the diagnosis as of doubtful accuracy. *Gunshot fractures* of the elbow-joint were observed in 2678 cases, with 513 known deaths, or a mortality in determined cases of 19.4 per cent. *Expectant measures* alone were employed in 938 cases, with 96 deaths (10.3 per cent.), but in at least 250 instances were supple-

mented by consecutive excision, and in as many if not more by consecutive amputation. Those patients, moreover, who recovered without operation suffered almost invariably from anchylosed or diseased joints (one of the few exceptions was in the case of the late Gov. Geary, of Pennsylvania), so that the actual results of expectant treatment were much less satisfactory than would appear from the bare statistical returns.

"The result as to the average usefulness of the limb after conservative expectant treatment is not flattering. . . . Among the survivors there were many examples of chronic arthritis, with caries and persistent fistulæ and exfoliations; many instances of paralysis and paresis, with shrunken and wasted limbs and contracted and powerless hands. The known instances of recovery with preservation of the functions of the joint were very few, and those with anchylosis in a favourable position, with freedom from disease about the joint and good use of the forearm and hand, were not numerous."

Excisions of the elbow, for shot injury, were practised during the war in 626 cases, the result in 10 being unknown, and the deaths numbering 146, the mortality in determined cases being thus 23.7 per cent., slightly more than the mean mortality of amputation in the upper arm, 23.6 per cent. There were 322 primary incisions, with four unknown results, and 68 deaths, or 21.3 per cent.; 197 intermediate excisions, with one unknown result, and 69 deaths, or 35.2 per cent.; 54 secondary excisions, with only five deaths, or 9.2 per cent.; and 53 excisions of uncertain date, with five unknown results, and only four deaths, or 8.3 per cent.

"In some of the cases returned as resections of the elbow, ... the operations consisted in little more than the removal of detached fragments of bone. Such cases impressively illustrate the disadvantages of partial excisions, with limited division of the articular capsule, whereby, as Professor Esmarch observes, that feature of the operation which deprives the wound of its danger, the extensive severing of the ligamentous apparatus of the joint, is omitted."

In regard to the ultimate usefulness of the limb after excision of the elbow, Dr. Otis points out that the reports of pension examiners are often misleading, on account of their general tendency to exaggerate, from humane motives, the pensioners' disability. Many men are thus reported as more or less unfit to follow their callings, though they may actually have fairly useful limbs. The same source of error has been noticed in Germany by Professor Langenbeck. The secondary excisions performed during the war are seen to have been very successful; the numbers are, however, almost too small to warrant positive inferences, while it must not be forgotten that the secondary cases were in the nature of things selected, the worst cases perishing during the primary and intermediate periods.

In addition to the cases dealt with in the preceding paragraphs, Dr. Otis has tabulated 138 examples of elbow-joint excision derived from Confederate records. These gave 81 recoveries and 19 deaths, the results in the remainder being unknown. The mortality in determined cases was therefore only 19 per cent., a favourable exhibit which is explained by the fact that these statistics were mainly collected in Richmond, where many disabled soldiers congregated to await the action of retiring boards, etc.

If saving of life has not, as justly remarked by Dr. Otis, been effected by the introduction of elbow-joint excision as a substitute for amputation in military surgery, yet the advantages of the operation, as a means of saving useful limbs, remain unimpeached. We are glad to learn that Dr. Otis intends to revert to the question of the "end-results" of these excisions,

in the Third Surgical Volume, and to submit more ample details upon the subject than it is possible to give at the present time.

Amputation at the elbow-joint was performed in 40 cases during the war, and with but slight mortality, only three deaths having been recorded as against 36 recoveries, the result of one case being undetermined. It is to be observed, however, that five of the successful cases only proved so after reamputation.

From a full consideration of all the evidence adduced on the subject of gunshot wounds of the elbow, Dr. Otis formulates the following conclusions, which we quote for the benefit of our readers:—

"1. That, in shot wounds in young healthy subjects, attended with slight injury of the articular extremities of bones of the elbow, such as fractures of the olecranon, of the outer condyle, or of the trochlea, without much splintering and without lesion of important vessels or nerves, it is justifiable, in many instances, to attempt an expectant conservative treatment, keeping the injured extremity in entire rest, after removing any detached fragments or foreign bodies, in a semi-prone and very slightly flexed position, employing ice or other cold applications. If the inflammatory action becomes intense, the wound should be freely enlarged and the joint cavity fully laid open, and easy escape provided for the altered wound secretions by position and drainage-tubes. The strength should be sustained by a tonic regimen, and when the inflammatory stage has completely abated, and not before, if healing is slow, secondary excision or amputation may be hopefully resorted to. Unless all the favorable conditions mentioned are present at the outset, it would be safer to resort to primary excision or to amputation.

"2. In grave shot comminutions with lesion of the principal vessels or nerves, amputation should be practised immediately after the reception of the injury.

"3. In severe shot fracture, without extensive lesions of the soft parts, the joint should be freely exposed by a longitudinal posterior incision, and the full extent of the fracture ascertained. Unless there is extraordinary fissuring, the injured joint ends should then be sawn off as close to the limits of injury as possible, save that the bones of the forearm should be shortened to the same level. If the splintering extends very far, or if there is reason to believe that the humeral vessels are injured, though not wounded, the incisions should be so modified as to convert the operation into an amputation."

Section Sixth treats of *Wounds and Operations in the Forearm*, an important category, since it is estimated that wounds of this region constitute between four and five per cent. of all wounds received in battle that are not immediately fatal. *Punctured* and *incised wounds* of the soft parts of the forearm were previously considered, but there are here seven cases referred to in which one or both bones were divided by blows from sabres; one, complicated with sword wound of the skull, proved fatal, and two of the others recovered with pseudarthrosis. *Contusions* and *partial fractures* were occasionally met with, ten cases of the former and thirty-two of the latter having been recorded. Of complete *shot fractures*, involving one or both bones, 5194 cases were observed, the results having been ascertained in all but 78, and the deaths numbering 482, a mortality for determined cases of 9.4 per cent. The death rate, when both bones were broken, was 11 per cent.; when the ulna alone was fractured, 8 per cent.; and when the radius only was implicated, 7.9 per cent.

Expectant measures were employed in the majority of cases, and in those in which the results were ascertained (2943) gave but 191 deaths, or 6.4 per cent. The death rate for fracture of both bones was 7.4 per cent.; for those of the ulna, 5.6 per cent.; and for those of the radius, 5 per cent.

Excision in the continuity of the bones of the forearm was practised in 986 instances, the number of deaths being 109, or 11.2 per cent. of determined cases. *Primary excisions of both bones* were done in 40 cases, with six deaths and twelve subsequent amputations; and "not a single really good result is noted among the twenty-two patients who retained their limbs." Primary excision of the *ulna* succeeded in 290 cases, and primary excision of the *radius* in 256; in nine successful cases, the bone operated upon was not specified. There were thus altogether 589 cases of recovery after primary excision in the continuity of the forearm, to be put against 71 fatal cases, and five in which the results were not ascertained; the death rate for determined cases was thus 10.7 per cent. *Intermediate excisions* were done in 149 cases, with 29 deaths, or 19.4 per cent.; both bones were excised successfully in nine cases, the ulna alone in 64, and the radius alone in 47. There were 40 *secondary excisions*, with 36 recoveries and four deaths, or 10 per cent.; and 132 excisions of uncertain date, with 16 undetermined cases, and only five deaths, or 4.3 per cent. The results of formal excisions in the continuity of the forearm, during the war, were so unsatisfactory as to have led Dr. Otis to condemn this mode of treatment in no measured terms, and to express a wish that the operation, as a primary procedure, "should be banished from the practice of military surgery." With great hesitation we would venture to express the opinion that this condemnation is too sweeping; the present writer has himself in one case had occasion to resort to primary excision of a portion of the radius for gunshot fracture, and he thinks with benefit to his patient. There can be no question, however, that the operation should be reserved for exceptional cases, and that extensive removals of bone are always undesirable.

Amputation of the forearm for gunshot injury was performed in 1747 cases, the results having been ascertained in all but 13, and the number of deaths having been 242, or 13.9 per cent. There were, in the upper third, 491 cases, with 66 deaths (13.4 per cent.); in the middle third, 676 cases, with 75 deaths (11.1 per cent.); in the lower third, 452 cases, with 56 deaths (12.4 per cent.); and at points not definitely indicated, 128 cases, with 45 deaths (37.8 per cent.). The *primary* operations numbered 1007, with 97 deaths, or 9.6 per cent.; the *intermediate* operations 450, with 106 deaths, or 23.5 per cent.; the *secondary* operations 184, with 29 deaths, or 15.7 per cent.; and the operations of uncertain date 106, with 13 unknown results, and 10 deaths, or 10.7 per cent. In seven of the successful primary cases both forearms were amputated. Dr. Otis's study of the records of both our own and other modern wars leads him to believe that—

"Except in the rare instances in which the tissues are almost disorganized, shot wounds and fractures of the forearm should be, in Loeffler's phrase, 'relegated to the domain of the limb-conserving art.'"

Wounds and Operations at the Wrist form the subject of Section Seventh. Gunshot fractures of this part were observed in 1496 cases during the war, and proved the cause of death in 193 instances, the mortality of determined cases being 12.9 per cent. *Expectant measures* alone were employed in 716 cases, with nine unknown results, and only 54 deaths, a mortality of 7.6 per cent. As justly remarked by Dr. Otis, however, these figures give too favourable a picture, as in many cases expectant measures failed, and excision or amputation was ultimately resorted to with an excessive proportion of fatal terminations. *Excision*

was practised in 96 cases; total excision in six, with one death, and more or less extensive partial excision in 90, with 14 deaths, a mortality of 15.5 per cent. There were 51 primary operations, with seven deaths (13.7 per cent.); 24 intermediate operations, with six deaths (25 per cent.); and 16 secondary operations, with two deaths (12.5 per cent.). In ten cases the period of operation was not specified, and of these, five were recoveries and five undetermined. In thirteen of the whole number of cases, consecutive amputation was required. *Amputation* at the wrist for shot injury was practised in 68 cases, with one unknown result, and seven deaths, or 10.6 per cent. One man submitted to amputation of both wrists. The operations were primary in 55 cases, with five deaths; intermediate in seven, with one death; and secondary in five, with one death. Both the period of operation and the result are unknown in one case.

Section Eighth, and last, deals with *Wounds and Operations in the Hand.* Gunshot fractures of the hand were observed in 11,369 cases, of which 316, or 3.1 per cent., terminated fatally. Excisions of the metacarpal bones were practised in 116 cases, of which 10 proved fatal. Nearly 8000 amputations of the fingers gave a mortality of less than 3 per cent.

"It is a grateful reflection," says Dr. Otis, in conclusion, "that while this volume has treated largely of the various modes of operative interference often indispensable in the surgery of war, the general teaching deduced from the multitude of facts tends, not only in regard to the hand, but in relation to every region, to justify and encourage an enlightened conservatism."

We have thus come to the end of our task, and, if we have succeeded in giving our readers even a faint notion of the value of Dr. Otis's volume, and of the immense store of carefully recorded facts which it contains, our labour has not been in vain. All that has been said in these pages or elsewhere in praise of the first volume, can be more than duplicated in commendation of the second. On some few mooted points of practice we have ventured to differ from the advice given by the author, and we have pointed out one or two trifling errors; but our wonder is not that a few mistakes have crept into Dr. Otis's book, but that a work of such magnitude should be so singularly accurate. The typographical execution of the volume is all that can be desired, while the thirty-five large plates (many of them beautifully coloured), and the seven hundred and forty-seven finely executed wood-cuts, mostly original, and others judiciously selected from works inaccessible to the ordinary reader, add inestimably to its value and usefulness. From beginning to end the volume reflects the highest credit upon all engaged in its production. J. A., Jr.

ART. XXI.—*Elements of Human Physiology.* By D. L. HERMANN, Professor of Physiology in the University of Zürich. Translated from the Fifth edition by ARTHUR GAMGEE, M.D., F.R.S., Brackenbury, Professor of Physiology and Histology in the Owens' College, Manchester; Examiner in Physiology in the University of Edinburgh. 8vo. pp. 576. London: Smith, Elder & Co., 1875.

PHYSIOLOGY is to-day certainly one of the most progressive departments of medicine.

As an evidence of the activity in physiological circles we may notice the interesting fact, that our book-lists contain no less than nine volumes, each giving a systematic account of the physiology of man, and each of which has been issued in its present form within the past twelve months; in fact, more than one-half of them bear the impress of Centennial '76!

We have presented in the volume before us a translation of Prof. Hermann's well-known *Elements of Human Physiology*, which, having reached its fifth edition since its appearance in 1863, has for a long time been the recognized text-book of the German schools. We have reason to congratulate ourselves that this, the work of one of the most earnest and distinguished laborers in the field of physiology, has been brought within the reach of the English reading profession.

From the translator's preface we learn that the present translation "was actuated by the conviction, shared in by nearly all teachers, that an urgent need existed for an English text-book, which should represent the actual state of the science." This conviction can hardly be shared in by the American profession. Within a comparatively recent period we have seen the completion of Flint's classical work and the birth of his text-book: the translation of Prof. Küss's lectures by Dr. Amory, and a largely rewritten edition of Dalton's admirable treatise.

However, we are prepared to give this new work a cordial welcome, the more cordial, because it does supply a want, not met by any of the late publications. Physiology has lately stood in need of some systematic treatise to harmonize her teachings and nomenclature with the recent developments in philosophy. This want is partially supplied by Professor Hermann. There is no other treatise on the subject which accepts the doctrine of conservation of energy or the correlated forces, or which attempts to build up a doctrine of life on the foundation offered by the recent developments in the physical sciences, so fully as the volume now under review.

Before speaking of the many excellent and distinctive features of this work, let us attempt an answer to the question: How well does Professor Hermann's "Elements," fulfil the purpose of its translation: that is, to furnish a text-book for the use of medical students? After careful consideration we must say that, in our opinion, the present work will not be a popular or useful one to place in the hands of the average student.

We draw the proof of our opinion, in part, from Dr. Gamgee himself, who writes in his preface:—

"The very condensed style of the whole work, the immense number of facts brought together under every section, and the constant assumption on the part of the author that the reader is possessed of varied and accurate knowledge of the sciences upon which physiology is based, may tend to dismay the student who brings to its study but a scanty preliminary education or a lukewarm zeal,

but this is a result which cannot be avoided by any author who treats his subject in a thorough manner."

Although Professor Hermann has christened his book "Elements of Human Physiology," it is by no means an elementary treatise; on every page it assumes a rudimentary knowledge of the subject, and very frequently simply refers by title (so to speak) to experiments familiar to few other than professed physiologists. Introducing into our nomenclature many of the terms of physical science, some even of late coinage, and presupposing a knowledge of physics and of organic chemistry which it is certainly not the fortune of the average student to possess, he will oftentimes find himself becalmed in a fog of doubt.

The very brief and necessarily imperfect description of the physiological anatomy of the several organs constitutes in our mind a very serious defect. Truly, it may be said that physiological anatomy belongs legitimately to histology, but that good old adage of our author's native tongue, "*Die Weiderholung ist die Mutter Erlernung*," should never be lost sight of in our intercourse with students. Besides, the belief is stamped with the seal of authority as old as Galen himself, that the study of function is inseparably linked with that of structure. Haller, the father of modern physiology, calls physiology "*anatomia animata*," and proved his faith by devoting thirty years of his life to anatomical pursuits before publishing his "Elementa Physiologiæ Corporis Humani."

The function of nerves is scarcely intelligible without a knowledge of their anatomy; certainly our author's discussion of the cranial nerves would have been more satisfactory, had he given more attention to pointing out their anatomical peculiarities, their distributions and anastomoses.

Again, the arrangement of the subject-matter does not impress us favourably; it is as unnatural as it is unique. For instance, we find the description of the digestive fluids separated from the chemistry of digestion by discussions of the tears, milk, sweat, urine, and other secretions. Absorption is treated of in detail before the chemistry of digestion is reached, and the discussion of food is introduced some forty pages after the subjects of digestion and absorption have been considered. We cannot commend the judgment which devotes more space to the discussion of the muscular system than is given to the combined discussion of the blood, and its circulation, and the whole subject of digestion. Again, fifteen lines suffice to dismiss the physiology of the heart sounds, while nearly as many pages of abstruse mathematics confuse the student in his study of vision.

Finally, we cannot but look upon the almost entire absence of diagrams and illustrations as an unfortunate omission in a text-book. We are all, perhaps, too prone to smile at the familiar plates which usually greet our eyes on opening a new volume; but we must not forget, that, though they may be old to the scarred veteran, they are useful and new to each successive generation of raw medical recruits.

While we thus limit its usefulness as a text-book partly from its own defects and partly from the defects of our system of medical education, we wish to accord it high praise as an exposition of modern physiological thought.

From this latter standpoint let us hastily call attention to some of the distinctive features of Professor Hermann's work; and first, let us remark that the peculiar arrangement and method already mentioned are so different from any other treatise on the subject, that we lose the aid of com-

parison, and find it very difficult to give a correct idea of the work without entering more into detail than our space will admit.

The keynote of the volume before us is found in the opening paragraph of the author's introduction, which we quote:—

"Formerly an attempt was made to explain the peculiar processes which have their seat in the animal organism, by supposing it to be endowed with properties special to it, and heritable, depending upon a supposed '*vital force.*' This vague conception has, however, been abandoned since the laws of inorganic nature have been discovered to preside over the most thoroughly investigated processes of life, and especially since the application to the organic world of a great principle of modern science has taught us the relations which exist between the changes in the matter and the forces of organized beings. Relying upon this knowledge, we believe the forces of living are the same as those of inanimate bodies, and that they obey the same laws, and consequently, that it will ultimately be possible to explain the hitherto incomprehensible phenomena of living beings, particularly their morphological processes, by physical and chemical laws. This conception possesses, quite apart from its probability, the great merit of introducing into the study of organic nature more precise views and more active research, and, although it has not been rigidly proven, will, in the present work, tacitly underlie the exposition of the processes of the human organism."

The work contains 576 large octavo pages, and is divided into four parts, which treat respectively:—

I. The Exchanges of the Matter of the Organism.
II. The Activities or Energies of the Body.
III. The Liberating Apparatus: The Nervous System.
IV. Origin, Development, and Death of the Organism.

Part I. is introduced with a brief account of the chemical constituents of the body. The usual classification based on the origin of these substances is here discarded, and instead, we have a classification based upon the chemical affinities of the several constituents. The chapter is illustrated by imaginary formulæ for the composition of many of the chemical compounds, which require the reader to refresh his organic chemistry if he would grasp in detail this really excellent introduction. Chapter I. passes directly to the consideration of the "Blood and its Circulation."

After commenting upon the fact that the blood is the medium by which the material interchanges between the constituents of the body and the external world take place, and that presumably every part of the body which participates in these chemical changes is constantly supplied with this life-giving fluid, we have the following reason assigned for the peculiar arrangement of subjects to which we have already called attention:—

"It is, therefore, expedient, in the exposition of the chemical changes which occur in the body, to consider the blood as its natural centre, and to classify the various processes as sources of expenditure or gain to the blood, before treating of the interchanges between the matter of the whole organism and the external world."

The "Gases of the Blood" are treated in an unusually thorough manner, and this discussion forms one of the very interesting portions of the chapter. In speaking of Hæmoglobin, to which is linked all of the loosely combined oxygen in the blood, we find the following statement, which is certainly not in accord with the observation of others:—

"Solutions of O-Hæmoglobin exhibit, when examined by means of the spectroscope, two absorption bands situated in the green (?) portion of the spectrum. Solutions of reduced hæmoglobin, on the other hand, exhibit a single, less-defined band, which occupies the interval between the two first bands."

The oxygen of the blood, owing to the readiness with which it is yielded up in the presence of oxidizable substances, is thought to be present in the form of active oxygen or ozone.

"The following properties of blood appear to favor this view: 1. Both the blood-corpuscles and hæmoglobin are so-called 'ozone-transferers,' that is they possess the power of immediately transferring ozone from substances in which it is present (as turpentine which has been kept for a long time) to readily oxidizable substances (ozone reagents, such as tincture of guaiacum, which becomes blue by oxidation, His, Schœnbein); for this reaction the presence or absence of oxygen in the blood is of no importance (for instance, it may be saturated with CO).

"2. Blood and hæmoglobin can themselves ozonize oxygen, so that in the presence of air they can cause guaiacum tincture to become blue (A. Schmidt): if the blood itself contain oxygen, the presence of air is not necessary: it is necessary if the blood has been saturated with CO (Kühne and Scholz). On the activity of its oxygen depends the decomposition of sulphuretted hydrogen by blood."

Under the "Death of the Blood" are described briefly the complex chemical changes which it undergoes in dying, viz., coagulation, acidification, deoxygenation, and calorification. Prof. Hermann approves the theory of A. Schmidt as regards the formation of fibrin: the combination of the fibrinoplastic substance and fibrinogen being due to a ferment developed during the death of the blood. The occurrence of coagulation is believed with Brücke to be the "result of the cessation of an influence exercised constantly upon the blood during life, by the living walls of the vessels. . . According to our present views of fibrin-formation, Brücke's law would be expressed as follows: the influence of the living vascular wall is to hinder the formation of the fibrin ferment, or to destroy it continuously as soon as it is formed."

The influence of the nervous system on the circulation of the blood is very well set forth in the eight pages allotted to the discussion. The innervation of the heart is described under the heads of Intracardiac Centres, Inhibitory Nerves, and Accelerating Nerves.

The intracardiac centres, to which the movement of heart is partially due, are supposed with great probability "to reside in the ganglionic cells (connected together by nerve fibres), which are lodged in the muscular substance of the heart, particularly in the septum between the auricles and at the junction of the auricles and ventricles." The *automatic* rhythmical contraction, and indeed the whole process of the heart's contraction from the auricles to the ventricles, is believed to be caused by these centres.

In speaking of the accelerating nerves, Prof. Hermann concludes that there does exist a system of nerve fibres which accelerate the heart's action, and the centre from whence these fibres proceed is placed in the medulla oblongata. That the vagus contains accelerating as well as inhibitory fibres is established by the fact, which has been recently shown by Schmiedeberg, that in poisoning by atropia, irritation of the vagus causes the heart to beat *more quickly*.

In Chapter II. is introduced the discussion of the various secretions as "Sources of Loss to the Blood." Secretion is here used in its widest sense, including all those processes in which substances quit the blood in an altered or unaltered form.

The secretions are divided into—

"1. Those liquids or gases derived from the blood, which exude from the internal or external surfaces of the body. Those yielded by internal surfaces (in

cavities or canals) called secretions in the restricted sense, are destined for particular uses (*e. g.* in digestion), and are for the most part again taken up by the blood after undergoing a certain amount of change. Those yielded by external surfaces—called 'excretions'—are, on the contrary, lost to the body, although certain of them (*e. g.* the sebaceous and sudoriparous excretions) have certain functions in connection with the surfaces where they appear.

"2. Those liquids derived from the blood which bathe the tissues of the body, parenchymatous juices, muscle juice, the fluid moistening connective-tissues, etc."

It is here taught that there is no essential difference between a secretion and an excretion—the fact of their being respectively liberated at internal and external surfaces proving nothing. In fact, the only difference between parenchymatous and free secretions seems to be that the former remain inclosed in a fine cellular network, while the latter quit their place of origin by passing through a layer of gland cells.

The analyses of the "Individual Secretions" which follow under the grouping of A. Parenchymatous tissues and their secretions: B. Fluids of cavities; and C. Glandular secretions, are excellent *résumés* of our knowledge of the composition, manner of secretion, and use of these fluids. We will here only call attention to the author's views upon the disputed uses of bile:—

"As animals with biliary fistulæ quickly grow lean, provided they are prevented from devouring the bile which escapes, it is supposed that the greater portion of the bile is reabsorbed in the intestines. The ultimate destination of the reabsorbed biliary matters is, however, not known; nor have the other circumstances which help to explain the starvation of the animals from which the biliary secretion is removed been completely eliminated from the question. Moreover, in the normal condition, all the biliary substances are found in the feces in considerable quantities—the colouring matters which colour the feces, bile-acids, mucus, cholesterin, etc.

"The bile-acids, especially taurocholic acid, undergo, in the lower part of the intestinal tube, a hydrolytic decomposition; there being found in the feces, therefore, glycocholic acid, cholic acid and their anhydrides, choloidic acid, and dyslysin (Hoppe-Seyler). The reabsorption of the specific constituents of bile is therefore doubtful.

"Unlike all the other secretions connected with the digestive apparatus, bile is probably of no importance in digestion proper (*i. e.*, in the preparation of food for absorption). The one property it possesses, which is of value for that purpose, viz., that of emulsionizing fats, is shared by it with other secretions which possess it in a far higher degree (pancreatic and, perhaps, intestinal juice). Solutions of peptones are precipitated by bile—a circumstance the importance of which will be spoken of in the next chapter. The importance of bile physiologically appears to be chiefly in regard to the absorption of fats. Bile (and the salts of the bile-acids), for instance, renders possible both filtration of fats through membranes under slight pressure, and diffusion between fats and watery solutions (von Wistinghausen), probably because it occasions the simultaneous imbibition of both (a condition of diffusion) in the form of soapy solutions. It renders easier also the passage of fats through narrow (capillary) tubes. Bile is also said to induce contraction of the muscular fibres of the villi (Schiff), and thus again to assist in the absorption of fats. It appears, moreover, to prevent putrefactive decomposition of the contents of the intestine."

Chapter III. treats of the "Reception of Material into the Blood." In the discussion of the preparation of food for absorption, the chemistry of digestion is disposed of in a manner not at all satisfactory.

Chapter IV. gives an account of "The Gaseous Interchanges (Income and Expenditure) of the Blood." The chemical processes which are con-

cerned in the distribution of gaseous substances in the animal body are designated by the term Respiration, to which the succeeding twenty-five pages are devoted. This makes one of the most thorough and clearest discussions in the book.

The lungs are regarded by Prof. Hermann, both in structure and function, as a racemose gland with a gaseous secretion, the excretory duct of which is the trachea. Since the blood is the important agent in the interchanges of oxygen and carbonic acid gas taking place in the economy, when this exchange is made with the surrounding air or water, it is known as "external respiration;" on the other hand, when the blood and the animal tissues are the factors, the process is called "internal respiration."

External respiration is caused largely, if not entirely, by the difference in tension between the gases of the blood and the external atmosphere; and hence then follows an admirable statement of the tension of the respiratory gases under different circumstances.

Our author locates the seat of internal respiration in the tissues themselves, believing that the view which places the seat of oxidation within the capillaries is improbable, because oxidation processes are so closely linked to the functions of organs that they must occur within them.

The appendix to this chapter contains some exceedingly valuable statements on the respiration of foreign gases.

Having thus far considered the causes of loss and gain to the blood, Chapter V. points out the means by which the blood retains its integrity. The interest of this chapter centres chiefly around the author's teachings as to the origin and development of the blood corpuscles.

While admitting that chemical changes in the constituents of the blood corpuscles are possible without any simultaneous morphological change, he believes the burden of proof is in favour of the birth and death of successive generations of corpuscular elements.

"1. The colourless blood corpuscles are identical with the lymph cells, but probably originate in new-born animals almost entirely in the *lymphatic glands* and *follicles* (as well as in some apparently similarly constructed organs, as the *thymus* and *thyroid* glands), in the *spleen* and the *marrow* of *bones* (Neumann). The cells which are made in the first-named organs are poured into the blood with the lymph; those which originate in the spleen and the marrow of bones, on the other hand (with the exception of those from the splenic follicles, which appear to belong to the lymphatic system), are directly mixed with the blood, in part, after being already converted into red corpuscles.

"The new formation of colourless blood cells appears to be thus shared by several formative organs, so that one can replace or supplement the other. This conclusion is drawn from the fact that extirpation of any of these organs (spleen, thymus, lymphatic glands, etc.), is followed by no bad consequences to the body, but is compensated for by a vicarious enlargement of the remainder. When, however, several of these organs are extirpated at the same time, life is endangered.

"The conversion of colourless into red blood corpuscles appears to occur generally throughout the blood, although it has only been directly demonstrated in the spleen, the venous blood of which contains numerous transitional forms, and in the marrow of bones. The chemical transformation upon which it depends, viz., the origin of hæmoglobin, is unknown; it is affirmed that this substance crystallizes with peculiar readiness in the newly-formed red corpuscles (Funke). Hæmoglobin appears to originate under the influence of oxygen, inasmuch as lymph and organs containing lymph are seen to assume a red tint on exposure to air (Virchow, Friedreich). The morphological change consists, according to the received view, in a disappearance of the nucleus, which is followed by a general flattening of the cell, which becomes red; at the

same time the corpuscle appears to permit of diffusion taking place into it more and more readily. The young cells which have just become red, as they are found in splenic and hepatic venous blood, swell but slightly in water, and are not as decidedly flattened as the ordinary older blood corpuscles, which are easily destroyed by water, are disk-shaped, and are also larger. In the frog the passage of colourless into red blood corpuscles can be directly observed to occur in blood which has been drawn from the body (v. Recklinghausen). The transitional forms which originate in this process are also observed in the circulating blood."

The red cells very likely meet their death in all those organs in which colouring matters originate, since, probably, hæmoglobin forms the base of all animal colouring matters.

In the method of treating Part II., on "The Activities or Energies of the Body," are reflected the distinguishing features of Prof. Hermann's book. We can probably give no better idea of the method of discussion here employed than by quoting from the Introduction :—

"In the general Introduction to this work it is stated that the animal body is the seat of transformations of potential into kinetic energy. It may be stated generally that the potential energy of the body is associated with two kinds of matter, widely separated from one another, viz., atmospheric oxygen on the one hand, and the oxidizable constituents of the body, which enter it as food, on the other. Energy-yielding substances are, therefore, being continuously introduced into the body. It has further already been stated, that the products of the combination of the above-mentioned different kinds of matter—*i. e.*, oxidation-products—are continually being thrown out of the body. Similarly it has now to be stated that the energy which has become kinetic in the animal body is continually being transferred from it to bodies existing in the medium outside and independent of it. Just as, however, the expenditure of the matter of the body is always a little below its income, so also the expenditure of energy is always below its income, for the organism always contains a certain store of energy, part of which is potential in its yet unoxidized constituents, part of which is kinetic—its heat. The transformations of the energy of the body run side by side with the exchanges of its matter. As in the preceding chapter, the income and expenditure of the matter of the body has been discussed and compared, the same task must now be undertaken in reference to its energies; while these must, as far as possible, be brought into relation with the exchanges of matter. The scanty knowledge yet possessed on this subject merely permits of the discussion of some of its salient points."

Recognizing the fact that the potential energy of the oxidizable alimentary constituents can be expressed in units of heat, we have first pointed out the fact that by experimentation the heat value of many of the alimentary substances has been determined. Oxidation, though not the only, is the most important process in the transformation of potential into kinetic energy—*i. e.*, the liberation of energy.

This kinetic energy may take the form of heat, electricity, or mechanical work. When the body is at rest, all these forms of energy are transformed into a single form—*heat*. During the performing of work, there is, in addition to that which is being produced during rest, an increased quantity of kinetic energy developed within the muscles, and which assumes the form of heat and mechanical work. All the potential energy of the food ingested passes as kinetic energy to the outer world, with the exception of the small quantity of energy lost by the organism in the imperfectly oxidized excretæ—milk, urea, etc.

This leads our author to the discussion of the relation between diet and work, which is at present so largely engaging the attention of physiologists :—

"In order to form a judgment as to the article of diet which would best supply the increased consumption due to any given act, we should require to know the constituent which principally undergoes oxidation during that act. The most direct way to acquire this knowledge would appear to be to study the organs, as, *e. g.*, the muscles, in which the various manifestations of energy are observed, and in which the oxidations proceed. As, however, this department of physiology is yet little developed, we must satisfy ourselves with a study of the changes in the excretions which correspond to increased evolution of kinetic energy. Especially has the amount of urea to be studied as evidence of the oxidation of nitrogenous bodies, and the amount of carbonic acid as expressing the oxidation-processes of the body in general.

"In consequence of doubtful statements (especially one which asserted that muscular activity increased the excretion of urea), the view was for a long time promulgated that only those nitrogenous constituents of the body which enter into the composition of the tissues are made use of in the production of mechanical work. It was supposed that no heat was developed from these nitrogenous constituents until by processes of decomposition they had furnished non-nitrogenous substances. The non-nitrogenous constituents, on the other hand, were supposed to be simply employed in the production of heat. Upon these hypotheses was based a classification of foods, according to their uses. . . . Since it has been ascertained, however, that the excretion of urea is not increased during mechanical work, this hypothesis has fallen to the ground; and the importance of the numerous considerations opposed to it is now fully recognized. Amongst these the following must be mentioned (Traube):—

"1. That even with a food which is very poor in nitrogen (vegetable food), a considerable amount of mechanical work can be performed; the majority of beasts of burden are herbivorous, and bees, though fed merely on honey, are continually in motion. Such facts as these could only be brought into harmony with the old theory by supposing that the mechanical work of the body, even when it attains a high magnitude, is insignificant in amount when compared to the heat formed—a view which has already been combated.

"2. That cold-blooded animals, and even animals and men inhabiting hot zones, and whose heat production can only be very small, yet live, in great part, on a vegetable diet, containing but little nitrogen.

"3. That carnivorous animals, in spite of the small quantity of non-nitrogenous food which they consume, have sufficient heat generated within them, even when they do not perform much mechanical work.

"4. It has, lastly, been directly ascertained that the albuminous bodies which are consumed in a given time (calculated from the amount of urea excreted) are not by any means capable of accounting for the work done during the same time, even when the heat of combustion of those bodies was calculated extravagantly high. (Fick and Wislicenus.)

"With this fact the circumstance is in harmony that the inhabitants of mountainous districts prefer to take fat and sugar as provisions when they have arduous journeys to perform. We cannot, therefore, point out any act accompanied with the evolution of kinetic energy, for which the consumption of a particular kind of food (nitrogenous food) is absolutely necessary."

The author does not seem to be familiar with the thoroughly scientific observations made by Prof. A. Flint, Jr., on the pedestrian Weston, in reference to the excretion of nitrogen during work.

The liberation of energy in the form of movement requires for its exhibition a peculiar apparatus—the muscular system—and Chapter VIII. is devoted to the discussion of this apparatus. This subject is a favourite one with Professor Hermann, and one, too, in which his name has long been familiar to the profession. Almost every page of the eighty devoted to the muscular system, bears evidence of his original work, either in the enunciation of a new theory or the discovery of a new fact. There is probably no work on physiology in the English language which contains

so full an exposition of the phenomena associated with muscular activity as the volume before us. After describing the structure of muscles, including the recent views of Krause, Hensen, Flögel, Engelman, and others, the details of which are still in dispute, and pointing out the chemical constituents, the phenomena of muscular tissue are grouped under the three conditions in which it may and does show itself—a state of rest, of rigor, and of activity.

Respecting the chemical processes taking place in muscle at rest or in activity, after alluding to the fact that muscular tissue continually converts arterial into venous blood, the remarkable statement is made that this gaseous interchange (the use of oxygen and the formation of carbonic acid) is not a vital phenomenon, but simply a phenomenon of putrefaction—"simply takes place side by side."

It is, however, admitted that since muscles retain their vitality somewhat longer in an atmosphere of oxygen than in an indifferent gas, some absorption of oxygen connected with their function must take place, which is, nevertheless, too small to account for the gaseous exchanges.

But as the same exchange of oxygen and carbonic acid is exhibited by muscle in a state of rigor as by living muscle, this cannot, in the majority of cases, be considered as the result of functional processes, but must be regarded as due to putrefactive change, which, in excised muscles, takes place at the surface and at the exposed transverse sections.

All through the discussion it is insisted that, very probably, the chemical changes occurring during rigor and contraction are identical. Now the amount of carbonic acid and sarco-lactic acid generated in rigor or activity is independent of the absorption of oxygen, since muscles are able to contract and to enter into rigor in a vacuum or an atmosphere of some indifferent gas; therefore, these processes are processes not of oxidation, but of decomposition, in which stronger affinities are saturated or satisfied and energy in consequence liberated.

We do not believe that the author has, by any means, made out a clear case; on the other hand, the researches of Paul Bert seem to conclusively prove that the absorption of oxygen and giving out of carbonic acid are true phenomena of respiration, of life, possessed, though in a less degree, by different organic tissue.

The common verdict of the profession, that, so long as these gaseous interchanges go on, life continues, and when they cease, life ends, is undoubtedly correct.

Prof. Hermann advances the following ingenious theory to explain the chemical processes occurring during contraction and rigor:—

"Muscle contains at any moment a store of a complicated nitrogenous substance dissolved in the contents of the muscle-tubes and in the muscle plasma, which may be described for the sake of brevity as the 'energy-generating,' or 'inogene substance.' This 'inogene substance' is capable of undergoing a decomposition in which energy is evolved and the following products yielded, viz.: carbonic acid, sarco-lactic acid, probably glycerine-phosphoric acid, and a gelatinous body, myosin, of an albuminous nature, which separates spontaneously and afterwards contracts firmly, becoming probably concentrated. This decomposition occurs spontaneously but slowly while the muscle is at rest, the rapidity of its occurrence being determined by the height of the temperature. It takes place instantaneously at the temperature of heat-rigor. It is, moreover, at once accelerated by stimulation; and this acceleration is essentially what occurs during the active condition. When the substance is entirely used up, muscular activity is no longer possible."

The recovery of an exhausted muscle, apart from the mere removal of the effete materials, is supposed to consist in a synthesis of this 'inogene substance,' in which myosin plays an important part, and for which the blood supplies some non-nitrogenous organic body hitherto undiscovered. Myosin is thus supposed to undergo in muscle a complete cycle of chemical changes.

However, this inogene or energy yielding substance, whose composition is supposed to resemble hæmoglobin, has so far successfully resisted all the efforts of chemistry to isolate it.

Prof. Hermann places the fullest confidence in his theory to answer the many rugged problems connected with the chemistry of muscle; the profession will probably be inclined to withhold its approval at least for the present.

The changes in form and the work performed by the contracting muscle are well described. He, however, emphasizes more strongly than any author with whom we are familiar, the diminution in volume which a contracting muscle undergoes, terming it, a "species of condensation." We believe the usual teaching on this point is practically correct. Lately Valentine, by a very minute process, has claimed to have shown that a muscle in passing into the contracted form increases in density in the ratio of $\frac{1}{1300}$th, a fraction too small to be worthy of notice. The familiar experiment upon which the author relies to substantiate his statement has never, in our hands, shown the positive result given in the text.

In view of the unsatisfactory nature of the theories usually adduced to explain the phenomena of muscular activity, we read with pleasure the following theories proposed by the author.

"The analogy, which is now complete, between the phenomena of activity and rigor warrants the proposition of a new theory of muscular contraction, which differs from the views previously held. The points of analogy between rigor and the active state are the following: 1. The chemical process so far as is known is the same in both conditions. 2. In both acts the muscle shortens and thickens, its volume diminishing and its electrical phenomena becoming less marked. 3. In both acts, heat is generated. 4. In both acts the contents of the muscle-tubes comport themselves electrically negatively towards unaltered (living and resting) muscle. In muscle which is entering into rigor, contraction of length is attributed to the coagulation of myosin, since it is well known that every albuminous tissue, *e. g.*, a tendon, contracts strongly in the direction of its fibrillation on coagulation such as occurs on the application of heat. As now the supposition that contraction in a living muscle is accompanied by a sudden and transitory coagulation is not contrary to any of the known facts, we may assume such a coagulation to take place on the grounds of the analogy between rigor and contraction. Moreover, the following circumstances seem to favor such an assumption.

"There are no grounds for supposing that any conversion takes place in muscle, of heat into motion (as in a steam-engine), or of electricity into motion (as in an electro-magnetic machine).

"There remains, therefore, only one possibility, viz., that of a direct origin of motion from the chemical decompositions which occur in muscular tissue. We can only imagine such a process to take the form of the production in consequence of chemical change of a new body, which endeavors, like the gases evolved on the ignition of gunpowder, to fill by elasticity a definite volume. That such is the case in muscle is already affirmed by Weber's theory, and we may very well suppose the new body to be due to a sudden coagulation of albuminous substance, the explanation of details being as easy in this case as in that of contraction of tendon on boiling. The heat and electricity generated in muscle, from the quantities in which they occur, are at all events by-products.

It is not yet decided whether they are dependent upon the processes of chemical decomposition, or upon physical changes of aggregation."

Part III., which constitutes more than one-third of the work, describes the nervous system, under the name of the "Liberating Apparatus"—"Die Auslösende Kraft."

The influence of the nervous system is held to be of a liberating nature, that is, a force which leads to the conversion of a certain amount of potential into kinetic energy. Prof. Hermann has presented here a generally good *résumé* of the salient points in the physiology of this intricate department; however, in some divisions of his subject, the discussion is eminently unsatisfactory.

The discussion of nerve fibres and nerve cells is separated by the interpolation of the special senses; and, indeed, until he has read over one hundred pages, the student is scarcely aware of the existence of nerve-cells. This arises from the method in which the author groups the organs of the nervous system into apparatus for conduction, central organs, sense organs, and end organs situated in the organs of work. The two latter groups may be regarded, and are so regarded in the body of the work, as peripheral end organs of the conducting apparatus.

The minute anatomy of the nervous system is very briefly touched upon. The three conditions under which nerves exist, rest, death, and activity, are pointed out, and the discussion of the latter condition is entered into at length.

The conditions which increase, diminish, or destroy the irritability of nerves are exceptionally well presented, as are also the various stimuli which call forth this irritability.

Prof. Hermann brings forth a theory of his own, in opposition to the commonly received theory of du Bois-Reymond, to explain the natural electrical currents of nerves. According to his view the nerve-current, like the muscle-current, is the result of contact:—

"The contents of nerve-tubes which are dying or in activity are negative to the contents of nerve-tubes which are living and at rest. The cause of the electrotonic phenomena is the polarization at the boundary between nerve-sheath and contents, to which reference has already been made. . . . If conduction in a nerve is nothing but the transmission of the condition of activity from one portion to another, then both the above theories of the nerve-current must require that, while a nerve is conducting, the point of it at which the active condition for the moment obtains must be negative towards every other point in the long axis of the nerve. No direct indication of such a condition has as yet been given."

The physiology of the cranial nerves is dismissed in the brief space of six pages, about one-half of which is devoted to the pneumogastric and the spinal accessory, which together are considered to make a mixed nerve. The whole reads more like a schedule to jog the lecturer's memory, than a guide for the student to this important and highly practical part of physiology. We are here told that the vagus contains, at its origin, motor fibres which proceed to the larynx, pharynx, and œsophagus. From the fact that Van Kempen's name appears in brackets annexed to the above, we infer that our author accepts his experiments on the origin of the vagus as conclusive. Van Kempen's experiments were published in the *Journal de la Physiologie*, Paris, 1863, and are open to serious objections. The weight of evidence is, we think, with Longet, in favor of the sensory character of the roots of the pneumogastric.

We find here once more repeated the injustice of attributing the discovery of the function of the spinal nerve roots to Charles Bell. The able review of this whole subject published by Prof. Flint, Jr., in 1868, should forever expunge this inaccuracy from physiological literature, and place the merit of this cardinal discovery where it rightfully belongs.

Chapter X. treats of the Peripheral End-organs of Nerves, and as the physiology of the conducting arrangements cannot be separated from that of the end organs, we have here introduced the whole subject of "The Special Senses." This chapter is unusually full and thorough, especially the section on the sense of sight, which occupies about eighty pages. However, the discussion is too largely encumbered with mechanical optics to be of great interest to the general practitioner.

The next chapter—the eleventh—discusses "The Central End-organs of Nerves." The characteristics of a central nervous organ are stated to be:—

"1. The liberation of the active condition in a ('centrifugal') nerve fibre, without the apparent participation of any external influence—*automatism*.

"2. The liberation of the active condition in one ('centrifugal') nerve fibre brought about through another ('centripetal') nerve fibre—*reflex action*.

"3. The phenomena collectively called *states of consciousness* or *mental operations*, which are connected with the irritation of certain central organs."

All organs of the body showing these characteristics contain ganglion cells as necessary constituents, which, from their direct communication with nerve fibres, must be regarded as the central end organs of nerve fibres. "It is, nevertheless, still doubtful," writes the author, "whether all ganglion cells ought to be considered as central organs, and whether there do not exist other central organs in addition to ganglion cells." We turn with considerable interest to the section on "the Properties of Ganglion Cells" to see what views so advanced a thinker as Prof. Hermann entertains on this intricate subject. After calling attention to the difficulty of the problem, he writes:—

"It is in the highest degree probable that processes of oxidation take place in ganglion cells as in all other organs. It is, however, still but a probability, unless we consider it evidenced by the fact that the venous blood of the brain and spinal cord is as poor in oxygen and as rich in carbonic acid (*i. e.*, as dark in colour), as the venous blood of any other region of the body. We are equally ignorant as to whether such processes of oxidation are concerned in the activity of the ganglion cells, and, if so, to what extent. We cannot say whether that activity is not dependent upon processes of decomposition, similar to those which occur in muscles and nerves, or what the results of such oxidations or decompositions are. Still less is known of the transformation of energy in ganglion cells. As far as can be judged, the energies which become kinetic or free in ganglion cells, are not of a nature which admits of investigation by the means at our disposal. We must suppose, in general, that molecular processes occur in them similar to, and immediately connected with, those which are assumed to occur in nerve fibres. If the active condition of a nerve fibre be imagined as a chain of successive liberations of force, the manifestation of energy in the ganglion cells must be regarded as the initial or final link of that chain; and the question now arises, what, in the first place, is the force which liberates the potential energy of the ganglion cell, and what, in the second, becomes of the force thus set free? The answer to these questions seems to be simplest in the case where the cell is intermediate between two nerve fibres, *i. e.*, in the case of *reflex* activities in the widest sense of the term. . . . In this case, therefore, we have but a single chain of liberations, the initial link of which (the original liberating force) is some influence on the external medium, which operates upon a peripheral end organ (organ of sense), and

the final link of which is the liberation of the potential energy of some organ of work, such as a muscle, gland, etc. The ganglion cells, in such a case, perform a function which differs in no essential respect from that of any portion of a simple conducting fibre. But the process which takes place during stimulations which are characterized as *automatic*, is far more difficult to understand. Under the title of automatic are included all those stimulations proceeding from a ganglion cell, in which the liberating force in the ganglion cell is unknown. In this case, two possible theories present themselves. Either the liberation of energy within the cells takes place without the aid of any liberating force, or the *automatism* is only apparent, the liberation being due to some operation of a reflex nature. Possibly many apparently automatic stimulations are to be explained on the latter supposition, as, indeed, has already been the case with some, viz., with the liberation of the respiratory movements, with muscular tonus."

The physiology of the central nervous organs is next given, a subject which the author designates as the "darkest region of physiology."

The spinal cord is introduced by a brief and necessarily imperfect description of its physiological anatomy. The reflex action of the cord is especially well described, better than is usually found in regular treatises on physiology.

Some space is devoted to pointing out the motor and sensory paths of conduction in the cord, but the effort is not distinguished for clearness.

Prof. Hermann holds the view that, probably, the spinal cord does not contain a single automatic centre, and arranges under the head of "orderly reflex actions," all those phenomena heretofore supposed to be dependent upon such centres, such as the maintenance of the tonus of muscles, the tonus of sphincters, etc. The succeeding forty-seven pages, constituting Part IV., closes the volume with a presentation of "The Origin, Development, and Death of the Organism."

The physiological career of the organism, from its inception to its death, is here hastily sketched.

This division of the book is well handled, but want of space prevents our giving an analysis of the subject-matter. In closing our lengthy but imperfect review of Prof. Hermann's Physiology, we may say, that, while we have had occasion to dissent from some of his teachings, in many respects we look upon it as the most marked of the late physiological publications, and well meriting the careful consideration of the profession.

The immense number of facts grouped under each section, with the abundant references to authorities, betoken great familiarity with the literature of the specialty, and commendable care in the collation of material.

The many original views set forth, the original manner of presenting accepted doctrines, the concise style, and the familiarity with detailed work, which the author constantly assumes, removes this work from the elementary to the advanced works on physiology. It is a book not alone to be read, but to be *studied*. We cannot speak in too high praise of the creditable manner in which Dr. Gamgee has performed his self-imposed task. The translation of the peculiar terse style of Prof. Hermann is by no means an easy matter; however, Dr. Gamgee has succeeded in rendering the work in classical English, free from that stiffness so often seen in translations. We think, in the present transition state of weights and measures, it would have been better had the translator appended a table of the metrical system, which is here used. The typography of the work is rarely excelled. The clear, large type, excellent paper, and accurate proof-reading, make a mechanical setting worthy of the book.

W. J. C.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXII.—*Saint Bartholomew's Hospital Reports.* Edited by JAMES ANDREW, M.D., and THOMAS SMITH, F.R.C.S. Vol. XI. 8vo. pp. xxxvi, 304. London: Smith, Elder, & Co., 1875.

THE opening paper in the present volume of this valuable series is a graceful tribute by Sir THOMAS WATSON, to the memory of the late *Dr. Peter Mere Latham*, a physician who is perhaps best known to us in this country by his work on diseases of the heart; but who would probably have left behind him even greater evidences of his industry and talents if he had not been compelled, by continued ill health, to resign his office of physician to St. Bartholomew's at an age when the powers of his mind were ripest. He appears to have been, moreover, a high-minded and honourable gentleman, one who won the affectionate regard of all those with whom he was brought in intimate contact.

As usual, we shall notice the medical and surgical papers separately.

The first of the medical papers is by Dr. ROBERT GREENHALGH, and entitled *The Causes, Diagnosis, and Treatment of Missed Labour.* This term has been applied to a class of cases of uterine pregnancy, in which, through failure of the parturient action, the fœtus is retained for an indefinite period beyond the term of normal gestation. In most if not in all the cases the fœtus has apparently been dead at the time when labour should have taken place; and the waters of the ovum have generally been discharged about this time or previously. Cases of obstructed labour due to mechanical impediment in the cervix uteri, of extra-uterine pregnancy, and of protracted gestation, have frequently been grouped with these; nor is it at all times an easy matter to distinguish them, such skilful accoucheurs as Montgomery and McClintock having each failed to recognize the true condition in a case of missed labour which came under his notice. Dr. Greenhalgh's explanation of the retention of the fœtus beyond the period of gestation is briefly as follows: The fœtus dying, there is at once an arrest of the development of the uterus which enables it in due time to take on parturient action.

In regard to the treatment of these cases, the author says, that, where a natural attempt at labour has occurred only a short time before the case is brought to his notice, he should be disposed to try to induce a recurrence of the uterine action in the usual way by dilating the cervix, using galvanism, ergot, etc. If, however, a long period has elapsed and there are no symptoms of irritation, he would leave the patient alone. In one case no ill results followed the retention of the fœtus for fifty-two years. Whenever constitutional or local irritation is set up, he thinks with McClintock "that this mass of fœtal corruption should when practical be exhumed from its living sepulchre." He recommends also that the uterine contents should be removed by degrees rather than by one long-continued operation, whereby the probabilities of inflammation will be lessened and the uterus will have time to contract. He believes that Cæsarean section can rarely be a justifiable operation in these cases.

In addition to the very full notes of Dr. Greenhalgh's own case, the paper contains the notes of nine additional cases, all of which are tabulated.

The Induction of Premature Labour is the title of a well-written paper which was read before the Abernethian Society of St. Bartholomew's Hospital, by Dr. CLEMENT GODSON. Of all the various plans for inducing premature labour, the author prefers the dilatation of the os uteri by means of sponge tents.

Dr. SAMUEL GEE contributes two short papers to the volume. In the first he reports a case of *Tuberculous Angina Faucium;* a disease which he contends is almost wholly overlooked by nosologists, and in which the angina is a part of a general tuberculosis. It does not seem, however, to present any well-marked characters by which it can, if there are no other symptoms of the diathesis, be recognized during life, for in the case which forms the nucleus of this communication Dr. Gee does not seem to have been certain of his diagnosis; until after he had discovered mesenteric disease. When speaking of the appearances presented by the throat, he says, "The ulceration of the soft palate progressed slowly until at length the uvula disappeared. But the condition was clearly very different from the quick melting down of the palate which occurs in the syphilitico-scrofulous or lupiform angina with which everybody is well acquainted. Slowness was very characteristic of the ulceration in this boy's case."

The second of Dr. GEE's papers is *on Laryngismus*, a disease which he asserts is more prevalent during the former half of the year than during the latter. Thus from the beginning of January, 1866, to the end of December, 1868, he saw sixty-three cases of laryngismus, fifty-eight of which occurred in the months of January, February, March, April, May, and June. He is inclined to attribute this preponderance of cases in these months to the fact that, in consequence of the chilly dampness of the English winter and spring, infants are kept very much indoors, "in rooms which are warm and close, a condition which," he says, "begets and increases an erethism of the nervous system, which shows itself in turn as a spasmodic diathesis."

In a paper entitled *Clinical Contributions to Practical Medicine*, Dr. DYCE DUCKWORTH expresses the opinion that cervical venous murmurs will be found to be audible in most well-marked cases of anæmia in males. The subject, he thinks, has hitherto escaped much attention because males are less frequently than females the subjects of grave anæmia, and hence the opportunities for noting venous murmurs in them are fewer. Pain he has found to be present always in zona, but not necessarily in the simple form of herpes. He recommends as the best local treatment for zona the application of flexible collodion. He has known hæmoptysis occasionally to occur as a consequence of nutritional changes in the pulmonary capillaries and arterioles in cases of emphysema where phthisis did not at the same time exist.

In some cases of rheumatic fever, Dr. Duckworth says, it matters not how they are treated, a certain stage is reached in which no measure appears so useful as the addition of a little brandy to the diet. In his experience no remedy has been so efficient in checking night sweats as oxide of zinc in doses of from two to four grains. He sees no reason for believing that beef-tea increases or aggravates any tendency to diarrhœa either in typhoid fever or chronic dysentery, and is sure that in these diseases diarrhœa is more likely to be kept up by the use of starchy food. That the patient may not suffer from the want of vegetable juices, it is well to adopt Sir William Jenner's suggestion of boiling some vegetables in a bag in the beef-tea.

There are many cases of interest in Dr. WICKHAM LEGG'S *Report from the Post-mortem Room.*

In the course of an article *on Uncontrollable Impulse*, Dr. T. Clayte Shaw says that no question is more important at the present day among the many problems of insanity than that having regard to impulse. "The fact that legal edicts do not acknowledge it, that in its application it has been abused, or at least overstrained, that it is an excuse so readily brought forward, that the very conditions of its existence are so obscure that, in attempting to reduce it to rules, science is at fault, all show that the subject deserves and requires the greatest latitude that actual experience can give it."

Mr. Norman Moore contributes *An Essay on the History of Medicine in Ireland*, which is founded on an examination of some MSS. in the British Museum, and in which the author shows a good deal of research. Its nature does not admit of its being analyzed, and we must, therefore content ourselves with this brief reference to it.

One of the most important of the papers in the volume is contributed by Dr. Lauder Brunton. Its subject is *Irritants and Counter-irritants*, especially with reference to their application in the treatment of rheumatism. We shall give his conclusions in his own words.

1. Dilatation of bloodvessels, and a rapid circulation through them, is advantageous for the tissues, and leads to increased growth and more rapid repair, while this arterial or active congestion is beneficial, venous or passive congestion is injurious. 2. The application of an irritant induces dilatation of the vessels, and a free current of blood through them; this will help to repair any injury done to the tissues by the irritant, so that the injury, to a certain extent, brings its own remedy. 3. Arterial congestion and inflammation are entirely different from and independent of each other, although they generally occur together. 4. Arterial congestion passes into inflammation when stasis begins to occur in the capillaries. 5. Stasis is not improbably due, as supposed by the brothers Weber, to coagulation of blood in the capillaries, the coagulation being induced by changes in the tissues composing the walls of the vessels, or immediately surrounding them. 6. Pain in an inflamed part is probably due to distension of vessels and pressure on nerves by the blood being pumped with violence through the dilated arteries against the obstruction in the capillaries. 7. Pain may be relieved by lessening tension in various ways; by position, by cold, by warmth, by blood-letting, by counter-irritatants. 8. Cold probably relieves tension by contraction of the arteries going to the inflamed part, warmth by dilating the capillaries of the surrounding parts, and thus drawing away the blood from the seat of inflammation. 9. At the same time that an irritant causes dilatation of the vessels in the part to which it is applied, it causes contraction of the vessels in other parts of the body. 10. It is probable that it does not cause contraction in all parts alike, but that definite areas of the skin correspond to definite sets of internal vessels. 11. The relief of pain produced by a blister in pleurisy, pneumonia, or rheumatic inflammation of a joint, is probably due to reflex contraction of the arteries in these parts. 12. Blisters are useful in lessening congestion in pericarditis, and in relieving the pain of inflamed joints in rheumatism. 13. The benefit derived from their use in young persons, especially those suffering from a first attack, is very great. In elderly persons it is inconsiderable. 14. The beneficial action of a blister in callous ulcer is probably due to the increased supply of blood to the part, induced by its application.

In some *Notes from the Gold Coast*, Mr. Thomas Jones gives the results of his experience in regard to the connection between dysentery and hepatic abscess, which is decidedly opposed to the theory advanced by Dr. Budd, that the former is a frequent cause of the latter. "So far," he says, "from dysentery on the Gold Coast being a frequent cause of abscess of the liver, out of about two hundred and sixty-three cases of the former disease seen by me, in not a single case was abscess of the liver present." He admits, however, that the

latter disease is not unknown in Africa, although of less frequent occurrence than in India or China. On the other hand, cirrhosis is not uncommon among the native population of the Gold Coast, as the result of the excessive use of alcohol. In the treatment of dysentery Mr. Jones recommends the administration of large doses of ipecacuanha in powder. He regards it as almost a specific.

In the remarks which follow the description of *Two Examples of Malformation of the Heart*, Mr. NORMAN MOORE expresses the opinion that by strict regimen, a patient with malformed heart may often be kept alive longer than statistics would lead one to expect. The patient, he adds, will never be fit for hard physical exertion, but may have health enough to be useful in life.

Of the *Three Cases of Disease of the Lungs*, reported by Dr. F. DE HAVILAND HALL, the first is a case of empyema, complicated with phthisis and emphysema. After thoracentesis had failed to give permanent relief, Dr. Hall introduced a drainage tube, which was allowed to remain in the chest just four weeks, at the end of which time all discharge had ceased; the patient made a good recovery. Some excellent remarks as to the treatment of empyema follow the report of this case. The second case is one of hæmoptysis, in which the author thinks the condition giving rise to the hemorrhage was dilatation of a bronchus, and not phthisis; an opinion, which rested principally upon the fact that the patient expectorated a large amount of fetid pus, and that there was no hectic and no great emaciation. The patient was seen three years later by Dr. Hall, who could discover at that time hardly any signs of the old lung mischief. During the hemorrhages, which were profuse, Dr. Gee was induced to try the effect of Trousseau's plan of giving ipecacuanha in ten-grain doses every ten minutes for three doses, vomiting being no counter-indication. It does not seem that the effect of this was particularly happy.

In the third case, a little boy, three years of age, had several convulsions which were found, upon examination, not to depend upon cerebral disease, but upon pneumonia of the apex. Dr. Hall calls attention to the importance of examining the chest in all cases of convulsions in children.

The *Case of Erythema Nodosum*, which forms the subject of a communication from Dr. PHILIP HENSLEY, is chiefly remarkable from the fact that the patient was an adult male (34 years), it being well known that the disease is more common in young women.

Mr. GEORGE HASTINGS reports a case of *Idiopathic Tetanus*, which occurred in a man aged 20, and which appears to have been the result of a thorough wetting. The patient, who was under the care of Dr. Southey, was ordered two drachms of the succus conii with twenty grains of the bromide of potassium every three hours. The disease, although somewhat tedious, ended in recovery in about six weeks.

Among the *Medical Cases* reported by Mr. VINCENT HARRIS, is one of *Secondary Syphilis*, in which the eruption was ushered in by paroxysms of high temperature, and symptoms resembling those of an ague fit. This was followed by similar paroxysms accompanying or preceding each increase of the syphilitic manifestations. A temperature chart accompanies the history of this case. The other cases were as follows: 1. Two cases of diabetes mellitus. 2. Malignant tumour of thyroid gland, involving glands of the neck. Cancer of the œsophagus, causing obstruction. 3. Osteo-arthritis with osteoid cancer affecting the sternum, ribs, right clavicle, glands of neck, and mediastinum and the liver, and causing fracture of sternum and right clavicle.

The volume also contains the *Proceedings of the Abernethian Society*—a

society which is composed of the officers and students of the Hospital. It will be found to contain abstracts of several interesting papers. J. H. H.

The first paper of special interest to surgeons is contributed by Mr. William Harrison Cripps, and is devoted to a consideration of *The Treatment of Hemorrhage from the Posterior-Tibial Artery in the Upper Two-thirds of its Course.* This paper, which may be regarded as a continuation of one published by the author in the preceding volume of the Reports, and noticed in the number of this Journal for October, 1875, page 482, is based upon an analysis of twenty-one cases, which Mr. Cripps has collected from various sources, and which he briefly reproduces in an appendix, though in several of them he unfortunately neglects to give the ultimate result. This oversight renders it somewhat difficult for the reader to test for himself the justice of the author's deductions, but we feel bound to say that Mr. Cripps's cases do not seem to us to prove the propositions which he seeks to establish. Thus his first case, which is one of those upon which he relies to show the disadvantages of Guthrie's plan of tying the bleeding vessel in the wound, might, with at least equal propriety, be quoted in opposition to Mr. Cripps's favourite mode of treatment by pressure and bandaging, for the latter plan was tried (no doubt clumsily, but still tried) for no less than eight days, thus rendering the case a very unfavourable one for any subsequent operation. Again, Case VII., in which death followed ligation of the vessel in the wound, was one of hemorrhage following the removal of a foreign body, which was reported by Mr. Callender in the last volume of the Reports (see No. of this Journal for October, 1875, p. 484), and which we do not hesitate to say might probably have terminated differently had the operator availed himself of the advantages to be derived from the use of Esmarch's bandage. Finally, Case VIII. seems to us very unfairly adduced as an illustration of Guthrie's method, for, the *posterior* tibial artery being wounded, ligatures were applied first to the *anterior* tibial, and then to the *popliteal*, when, as might have been expected, gangrene ensued, and the limb had to be amputated.

In his cases of ligation of the femoral artery for injury of the posterior tibial, Mr. Cripps makes no distinction between cases of *hemorrhage* from *open wound* of the artery, and those of *subcutaneous laceration* of the vessel as a complication of simple fracture. In the latter set of cases, deligation of the femoral artery is no doubt the proper mode of treatment, but in the former the surgeon's choice should, it seems to us, rest between ligation in the wound and amputation. We think it but right to say here, that Mr. Cripps has (unintentionally of course) misrepresented Prof. Erichsen's views upon this subject, in his references to that author's writings on pages 95 and 98. Prof Erichsen recommends immediate amputation in cases of *compound* fracture of the leg in its upper third, attended with wound of one of the tibial arteries, and in cases of simple fracture attended with rupture of the *popliteal;* but he distinctly advises ligation of the femoral in cases of simple fracture complicated by diffused traumatic aneurism, in which the symptoms show that the injured vessel is the posterior tibial.

Mr. Cripps's Case XVIII. illustrates nothing but bad practice; it was one of simple fracture accompanied with rupture of the posterior tibial, and, had either ligation of the femoral, or amputation, been promptly resorted to, a fair chance would have been given for recovery. But nothing was done for nine days, when, the limb being already gangrenous and the patient, of course, in the worst possible condition, amputation was practised, and death followed an hour later. We shall not dwell upon Mr. Cripps's cases of successful employment

of bandaging and pressure, further than to say that one (Case XX.) was a case of *primary* hemorrhage from a simple incised wound, in which as all bleeding was definitively controlled by pressure, obviously no other treatment was necessary, and that the other (Case XXI.), as quoted, furnishes no positive evidence that the posterior tibial was really wounded, but, on the contrary, the strongest probability that the hemorrhage came from a smaller branch enlarged by inflammatory action.

We have given a good deal of space to Mr. Cripps's paper because we consider it an able one, and all the more dangerous because of its ability. Every few years some fresh writer arises, who undertakes on the strength of a few new facts, or of a hasty generalization from old ones, to overturn the rules for the treatment of hemorrhage which have been painfully established by the experience of generations; and though of course he does not eventually succeed, he manages to unsettle the minds of youthful operators, and the value of the old rules has to be again and again demonstrated at the cost of human suffering.

Some Cases of Congenital Dislocation of the Hip-Joint, with Remarks, form the subject of the next paper which demands our attention, and which is furnished by Mr. HOWARD MARSH. Fourteen cases are narrated by the author, five being typical examples of double congenital dislocation, as described by systematic writers, while the other nine were cases of unilateral luxation, five of the right side and four of the left. Most of these had been mistaken for cases of hip disease or of infantile paralysis, an error which Mr. Marsh believes may always be avoided by making a careful examination.

"Diagnosis," he says "must rest on evidence, part of which is positive, and part negative, the latter being quite as important as the former. The positive evidence consists in (*a*) lameness, which is usually very marked; (*b*) shortening of the limb, which is also smaller and weaker than that of the opposite side; (*c*) lordosis; it may be observed that the degree in which this is present depends upon the position of the end of the femur; if the dislocation is upwards and backwards, lordosis will be well marked: while if it is in a direction upwards towards the anterior superior iliac spine, lordosis will be very slight, for the inclination of the pelvis is not altered to any material extent; (*d*) an abnormal conformation of the upper end of the femur, the head and neck being small and ill-shapen, or wholly absent; and its abnormal relation to the side of the pelvis, whether it be movable on the dorsum ilii, or held in a false joint more or less removed from the natural position of the acetabulum; (*e*) some defect in the ball-and-socket movements natural to the hip-joint, particularly in abduction and rotation outwards. The negative evidence is that there has been at no time any symptom of morbus coxarius, or of any accident by which dislocation could have been produced. It is usually easy to exclude infantile paralysis; for the limb, though undersized, is under perfect voluntary control, the child can move it freely in all directions, and its temperature is natural. Besides this, in the one case the joint is well formed, while in the other it is plainly abnormal."

Mr. Marsh's views as to the causes and treatment of congenital hip dislocation, are reserved for a future communication.

The next paper is on *The Treatment of Stone in the Bladder of Female Children*, and is contributed by Mr. W. J. WALSHAM. This paper is founded upon a study of sixty-three cases collected by the author, which are appended in tables, and classified according to the mode of treatment employed in each instance. Mr. Walsham's conclusions, which seem to be sustained by the evidence adduced, are as follows:—

"1. That for small stones, both rapid and slow dilatation of the urethra, in children as in adults, are good operations.

"2. That of these two, rapid dilatation under chloroform is perhaps the better, as causing less annoyance and inconvenience to the patient.

"3. That moderate and even large-sized stones have been removed by dilatation; but that, as incontinence has frequently followed from over-distension, it is not justifiable to subject the patient to this risk.

"4. That, after limited dilatation, should the stone appear larger than was anticipated, it may be crushed with safety; but should crushing be considered unadvisable or impossible, it is better to perform vaginal lithotomy than subject the patient to any risk of incontinence by over-dilatation.

"5. That it is not safe to aid the dilatation by incising the urethral walls.

"6. That incision of the urethra alone, without dilatation, in whatever direction practised, is frequently attended by incontinence, and should therefore be abandoned.

"7. That moderate and even large stones can be safely removed from young children by vaginal lithotomy, aided, if necessary, by dilatation of the vagina, incision of the fourchette, and crushing of the stone through the wound made in the septum, without any risk of a permanent vesico-vaginal fistula, so long as the edges of the incision are not bruised in the extraction.

"8. That the incision in the septum should be very free, but not involve the walls of the urethra; and, should that first made be found too small, it should be enlarged before any attempts at extraction are undertaken.

"9. That, should a fistula remain after this operation, even when carefully performed, it can be readily closed.

"10. That, after the incision has been prolonged to the limits of safety, the stone still appearing too large for easy removal, and crushing being considered unadvisable or impracticable, it is better to open the bladder above the pubes than, by lacerating the sides of the wound by forcible extraction, to subject the patient to the possible danger of a permanent vesico-vaginal fistula.

"11. That the lateral operation, as practised by Dr. Buchanan, of Glasgow, appears well adapted for children suffering from a small stone, or, perhaps, one of moderate size; and that, as it has been successfully practised in India and Glasgow, it is deserving of trial in this country.

"12. That *very* large stones can only be removed by hypogastric or vaginal lithotomy; and that, as the latter proceeding would in this case be probably followed by a permanent vesico-vaginal fistula, it is better to choose the more dangerous operation than subject the patient to this loathsome affection.

"13. That the supra-pubic operation, when carefully performed, is possibly much safer than is generally supposed; but that, as it may be followed by death, it should only be undertaken when all other alternatives threaten permanent incontinence."

Mr. Henry Power contributes *Selected Cases of Injury of the Eyes.* These cases, thirty-nine in number, are all of some interest, but do not call for special comment. Many of them serve to illustrate the propriety of early enucleation in cases of suspected lodgment of a foreign body in the vitreous.

A short but very valuable *Report on the Treatment of Ruptured Perineum* is from the pen of Mr. Thomas Smith. Mr. Smith, like most British operators, employs a double set of sutures, one deep and the other superficial. The deep sutures, which he prefers to be made of soft, thick, silver wire, are passed through perforated shields of sheet lead, one on either side of the perineum, the wires on one side being simply twisted together, and on the other secured by clamped shot. Before fastening the sutures, Mr. Smith makes "lateral incisions, two inches or more in length, parallel to the line of the wound, and made deep into the fat of the buttock;" regarding these lateral incisions as much more effective than the sections of the sphincter ani recommended by Mr. Baker Brown. Mr. Smith makes no effort to prevent the action of the patient's bowels after the operation, but, on the contrary, directs that she should be cautioned under no circumstances to attempt to exercise any control over the sphincter, but to allow the passive escape of both feces and flatus

whenever any inclination to do so is felt; he, moreover, prescribes a simple aperient (unless the bowels have been spontaneously moved) just before removing the deep sutures, which he does not allow to remain, on an average, longer than one week.

A Case of Femoral Aneurism Cured by Digital Pressure is reported by Mr. W. MORRANT BAKER, as a contribution to the statistics of this mode of treatment, but presents no features of sufficient peculiarity to require special remark.

We turn therefore to *Notes of Three Cases of Air in the Cavity of the Pleura as the Result of Injury;* by HENRY TRENTHAM BUTLIN. These cases are all of much interest; in the first and second, the patients recovered, and the diagnosis therefore lacked post-mortem confirmation; but the symptoms and histories rendered it almost certain that rupture of the lung had occurred in both without injury of the thoracic parietes. In the third, the symptoms of pneumothorax were found after death to be due to the passage of the stomach, enormously distended with gas, through a laceration in the diaphragm, or, in other words, to the existence of a large diaphragmatic hernia. In commenting upon his first two cases, Mr. Butlin refers to a similar observation published by Sée, and mentions that he has himself made an autopsy in a case of pulmonary laceration without fracture—a case which we presume to be that recorded at page 45 of the Appendix to this volume of Reports. In the *Transactions of the Philadelphia Pathological Society* for 1871 (vol. iv. p. 133), the present writer tabulated sixteen cases of rupture of the lung without injury of the thoracic wall; adding to these, cases since recorded by R. Nelson, Da Costa, W. Adams, and Hilton, and the four mentioned by Mr. Butlin, we have a total of twenty-four examples of this rare form of injury occurring in civil life—seven having terminated favourably and seventeen in death. In military practice, the affection appears to be less fatal—twenty-five cases referred to by Dr. Otis as having occurred during our late war (*Medical and Surgical History of the Rebellion*, First Surgical Volume, page 477) furnishing no less than eleven recoveries.

The *Hospital Statistics*, which terminate the volume, are supplied by the Medical Registrar, Dr. W. AINSLIE HOLLIS, and the Surgical Registrars, Messrs. HENRY T. BUTLIN and EDWARD MILNOR. They contain as usual a great deal of valuable material in a form convenient for study. On pages 11 and 82, we find references to three fatal cases of "lithonephrotomy."

J. A., JR.

ART. XXIII.—*Transactions of the Obstetrical Society of London.* Vol. XVII. For the year 1875. Text, pp. 400. London: Longmans, Green & Co., 1876.

THIS volume is an unusually large one, as it contains a list of the Fellows, filling 51 pages, and a catalogue of the library, occupying 140. The ordinary Fellows number 637.

Case of Hydatiform Mole. By JOHN WILLIAMS, M.D.—This occurred in a woman of 30, and is chiefly remarkable in the fact that the ovum was expelled almost entire, the bag being ruptured, but preserving the shape of the uterus, and showing the manner of attachment of the vesicles within. "The bag was evidently formed by the decidua, and was about a quarter of an inch in thickness. At one part it was thick and fleshy, though on section it presented many

cysts. The thickened portion was doubtless the imperfectly formed placenta." . . . The vesicles "were arranged like beads on a string, which was attached to the inner surface of the decidua."

Complication in the Delivery of an Ascitic Fœtus. By J. Ashburton Thompson.—Case occurred under care of the Royal Maternity Charity. Mother 38—tenth confinement—feeble and emaciated from poverty and want; had been no motion of fœtus for two weeks. Moderate traction with forceps tore through the neck in delivering the head; the arms were then brought down, but traction failed to bring away the body during twenty minutes' effort. Two labour pains, reported as trifling, in the absence of the physician, delivered the fœtus. Woman died in 93 hours, presumably from pyæmia. Cause of difficulty believed to be the collection of ascitic fluid in the lower part of the abdomen during traction, widening and enlarging the resisting protuberance so as to prevent its passage. The ready removal under nature's efforts is accounted for by the uterine pressure forcing the fluid through the obstructing point and thus elongating and narrowing the abdominal protuberance, so as to favour the delivery of the flaccid fœtus.

On the Prevention of Mammary Abscesses by the Application of the Principle of Rest. By W. Bathurst Woodman, M.D.—By reasoning from the effects of over-distension of the mammæ in the lower animals, when deprived of their young, physicians have been led gradually to discard the use of friction, and give the glands as much absolute rest as possible. Dr. Woodman puts the patient in bed, stops nursing, applies pressure, and resorts to the internal remedies which diminish the secretion of milk. In the discussion following his paper, the application of a belladonna plaster, abstinence from all fluids, except a little melted ice, the use of tincture of aconite in minim doses every hour, and of iodide of potassium, very low diet, and pressure with the handkerchief bandage, were recommended as valuable preventives of the formation of abscess.

Treatment of Chlorosis and Anæmia with the Phosphide of Zinc.—Dr. J. Ashburton Thompson claims very marked and rapid improvement in some cases by the use of phosphide of zinc, which he gives in half-grain doses associated with some acid preparation of iron three times a day; and especially in subjects where neuralgia is a prominent symptom. Caution is to be observed in the use of this remedy, which is sometimes poisonous in the first dose.

Treatment of Rigid Perineum, and the Avoidance of its Rupture. By H. Ernest Trestrial, F.R.C.S.—The plan recommended is the forcible distension of the vulvar opening, by hooking it backward towards the coccyx with two or three fingers, until the tissues are sufficiently distended to admit of the use of the forceps, or a natural birth, without risk of rupture. This was for many years a common method with the late Dr. William Harris of this city, who claimed that in cases of feeble uterine action it frequently induced much more forcible efforts at expulsion when tried during a pain.

On the Relation of Puerperal Fever to the Infective Diseases and Pyæmia.—This paper, by Mr. T. Spencer Wells, F.R.C.S., occupying eleven pages in the Transactions, was introduced mainly for the purpose of provoking discussion upon six points, viz.:—

"1. Is there any form of continued fever, communicated by contagion or infection, and occurring in connection with childbirth, which is distinctly caused by a special morbid poison, and as definite in its progress and the local lesions associated with it, as typhus or typhoid, scarlet fever, measles, or scrofula?

"2. May all forms of puerperal fever be referred to attacks of some infective continued fever, as scarlet fever or measles, occurring in connection with child-

birth, on the one hand; or, on the other, to some form of surgical fever, or to erysipelas, caused by or associated with changes in the uterus and neighbouring parts following the process of childbirth?

"3. If all cases of contagious and infectious diseases which occur under other conditions than that of childbirth are set aside, does there remain any such disease as puerperal fever?

"4. Assuming that a form of continued fever communicable by inoculation, contagion, or infection, does frequently occur in connection with childbirth, how can its spread in private and in hospital practice be most certainly prevented or checked?

"5. What relation have bacteria and allied organic forms to the pyæmic process in the puerperal state?

"6. What is the value of antiseptics in the prevention and treatment of puerperal fever?"

To judge of the interest excited in the Society by the introduction of this important and complex subject, we have only to state that the discussion of Mr. Wells's paper extended through four meetings, occupying a large proportion of the time of each; that the attendance averaged nearly a hundred; that the report fills 150 pages of the "Transactions," in addition to the introductory article, or 161 in all; and that the following named parties took an active part in the discussion:—

Drs. Leishman, Newman, Braxton Hicks, Jonathan Hutchinson, Richardson, Barnes, Squire, Brunton, Jarrow Huntley, Brown, Clifton Swayne, Graily Hewitt, Arthur Farre, Savage, Wynn Williams, Playfair, Tilt, Constantine Holman, Fordyce Barker (of New York), Charles West, Greene, Routh, Wallace, Griffiths, Mr. Callender, and Mr. Spencer Wells in reply—26.

In reading carefully this long discussion, we are most struck with two things; the varied and often directly opposing opinions held by learned and close observers, and the little that we have yet learned to make our knowledge of the formidable disease in question a positive one, either as to its true nature, or the best means of prevention and cure. Men of large experience as obstetricians vary exceedingly as to their practical knowledge of puerperal fever, years in some instances having passed without the occurrence of a single case in an extensive practice; and in others scarcely a year without one or more cases. An examination of the discussion shows how differently symptoms of disease are valued, and what differences of impression are derived from an examination of corresponding circumstances leading to or existing in disease, even by the most celebrated medical observers.

There is scarcely a step in all the six points given by Mr. Wells in which entirely opposite views were not advanced; but still, from the force of argument, and the preponderance of numbers, we are able to form a judgment without much difficulty as to the prevalent views held upon many points of interest.

1. It appears to be the general opinion that there is a very intimate relationship between erysipelas, especially of the phlegmonous type, and puerperal peritonitis; and that the former is capable of producing the latter by infection, and vice versa, as shown repeatedly by incontestable evidence.

2. With regard to the connection between puerperal fever, on the one hand, and scarlet fever, measles, diphtheria, typhus, and smallpox on the other, there is a much greater diversity of opinion in the Society, and the profession generally. Scarlet fever does attack puerperal women without any of the symptoms peculiar to childbed fever being present. A puerperal woman may be exposed to the disease and escape, whilst her child may be seized with it shortly after birth and die. There are also cases in which puerperal fever would appear to originate in scarlet fever; and there are forms of the former occurring in isola-

ted country districts without exposure to scarlet fever, where there is a rash accompanied with some soreness of the throat. Sewer gas would also appear capable in some cases of producing diphtheria, typhus, or puerperal fever, according to the susceptible state of the party inhaling it; but it is a point difficult to separate from a coincidental condition, without a long array of facts to establish it.

3. The preponderance of opinion would appear to be in favour of the belief that puerperal fever is inoculable, infectious, and contagious: that students from the dissecting room, dressers from surgical wards, physicians treating abscesses, especially erysipelatous cases, and nurses attending puerperal peritonitis subjects, may infect parturient women.

4. A common cause of puerperal fever is believed to be the absorption of poisonous matter from the vagina, uterus, or lacerations of the perinæum; arising in decomposition of retained clots, blood, or lochial discharge; in proof of which we have the benefit often experienced from washing out the uterus and vagina with tincture of iodine and water, dilute Condy's fluid, solution of permanganate of potash, and other antiseptic preparations.

5. Whether puerperal fever is a multiform disease or has a true oneness of character like typhus, measles, or scarlet fever, is a question which appears to be of questionable solution with our present knowledge. With some it is a defined disease, a form of continued fever, having well marked characteristics, whilst with others it is a septicæmia, a pyæmia, a phlebitis, etc. Dr. Fordyce Barker held firmly to the opinion that childbed fever is a distinct essential disease, in which view he held opposite ground from many of the fellows.

6. The question of the influence of *bacteria* and *vibrios* in generating or aggravating the disease was but slightly touched, our present state of knowledge not being considered sufficient to base a positive opinion upon. The prevalent judgment was that these animalculæ are only a secondary result of disease, and not a primary cause.

As preventive means are much more to be relied upon than curative in childbed fever, it is well in both hospital and private practice to adopt every known precaution for reducing the number of cases as nearly as may be to those known as *autogenetic*. Besides the hygienic measures necessary for securing the health of the woman, obstetricians should avoid attending cases of labour while having under care puerperal fever, erysipelas, abscesses, or any of the class of diseases known as *zymotic*. Nurses should also avoid going to parturient women when they have been recently waiting upon any case of the kind mentioned. The clothes of students and dressers should be changed, after taking a Turkish bath, and their hands cleaned by an antiseptic wash. A few weeks of interval, and the same cleansing process, should be adopted by physicians and nurses after leaving finally a case of puerperal fever, before attending the next one of labour. Autopsies should not be made by obstetricians. Three physicians of this city once examined a case of erysipelas after death, and were all called in the following night to cases of labour: the three women all took childbed fever and died. Purulent discharges, whether from an abscess, a cancerous disease, or a syphilitic ozœna, may set up a mysterious influence which shall lead to puerperal fever in some parturient women, although there is in cancer and syphilis no similarity with puerperal peritonitis. They appear to act simply as pyogenic diseases, conveying infection through the influence of septic poisoning. We have known syphilitic caries of the bones of an accoucheur's nose to be the fruitful source of septic infection in a large number of parturient women under his care. All forms of dead matter seem to be capable of lighting up the fire of puerperal fever, whether from the dissecting room, the

surgical ward, or private practice; and even the effluvia when inhaled would appear capable of the same power.

We are not of those who would denominate childbed fever by a pleural title, or call it pyæmia, septicæmia, or purulent phlebitis, according to the peculiar phenomena of the case, as shown in the origin of attack, progress of the disease, or by examination after death. We hold with Dr. Barker that there is such a disease as *puerperal fever*, marked in its origin and character as a distinct and essential malady; having no greater variety in its types than is to be found in erysipelas, which closely resembles it when it prevails in the form which has been denominated *malignant internal erisipelas*; and determined in its special type by the manner of introduction, grade of poisoning, and physical state of the subject. When we regard the physical condition of a woman after parturition, the amount of blood lost, the character of the utero-placental laceration, the frequent abrasions or tears of tissues, and the great tendency that exists in the female uterus to become inflamed under very slight surgical provocation, the wonder is that inflammatory post-partum fever originating in mischief set up in the tissues of this organ is so comparatively rare.

Intra-Mural Calcareous Tumour Impeding Labor. By Dr. A. WYNN WILLIAMS.—Patient 45, primipara; bony mass appeared to be of pelvic origin when first detected, covered with mucous membrane, and firmly attached at the left sacro-iliac symphysis, and stretching across the pelvis, so as to force the os uteri to the opposite side of the cavity. The child's head was perforated, and an attempt made to deliver by craniotomy, in the ordinary way, but failed. Cephalotripsy was then resorted to, but in the mean time, labour had so advanced, and changed the relationship of parts, that the bony tumour was discovered to be intra-uterine, and to present before the head. The mass was seized and partly broken by the cephalotribe, the head was then brought down, and the fœtus delivered, after which, the removal of the placenta being interfered with, the operator introduced his hand into the uterus, and removed the larger remnant of the calcareous mass, which was found pocketed in the side of the lower segment of the uterus. This tumour would appear, from its having undergone calcification, to have been an old fibroid; to have been enucleated in the act of craniotomy, and to have slipped back into its pocket so as to allow the head to descend a second time, after a portion was broken off by the cephalotribe.

Case of Extreme Hypertrophy of Placenta, with Fatty Degeneration, in a Dropsical Subject. By Dr. JOHN BRUNTON.—Primipara, in beginning of eighth month of gestation. Lady generally dropsical; right hand and left foot presentation; feet brought down; placenta removed, and subsequently two separated portions, making the mass three times the average size. Fœtus gasped once or twice, and died. Urine of the patient highly albuminous; her face, body, and extremities showing an advanced stage of dropsy; was doing well at the time of report. Placental hypertrophy considered dropsical, and the separation of the two fragments, the result of uterine contraction upon the large mass, as there was no concealed hemorrhage, and the placental tissue was very friable.

Autopsy of a Woman upon whom the Cæsarean Operation was Performed Successfully in 1866. By Dr. WM. NEWMAN.—In the report of Dr. Radford, we find this case to be that of Ellen O., aged 27; in labour 4 days; the "cause of difficulty" being given as "*Extensive epithelioma of the cervix, and lower part of the body of the uterus.*" . . . The recent statement made to the Society shows that six years after this operation, she was delivered again by Dr. Newman, with the long forceps; that early in 1873, she claimed to be in very good health, and looked strong and well; and that in August, 1874, the old cicatrix gave way, an abscess formed, leading down into the pelvis, and discharging

through the cicatrix, and the woman died, after having some stercoraceous vomiting, and symptoms of peritonitis. . . A post-mortem examination revealed the following. Slight evidences of circumscribed peritonitis existing near the wound; no adhesion whatever of either uterus or ovaries to any portion of abdominal contents; ovaries appeared perfectly healthy; no evidences of cancer apparent. Dr. Newman stated that in 1871 there were distinct traces of scar tissue, the cervix being deeply indented and changed in structure.

General Dropsy in the Fœtus. Case reported by Dr. Protheroe Smith; another by Mr. Lawson Tait.—Dr. Smith's was born of a delicate woman of 35, who in 13 years had two healthy living children and seven miscarriages. In the last two miscarriages (in 1874 and 1875), mother had albuminuria, with slight anasarca of extremities and face for a few weeks prior to labour. No suspicion of syphilis. Fœtus at 26th week; whole body extremely anasarcous; no cardiac disease; abdominal organs in no condition of change to account for the dropsy. Dr. Smith attributed this to "hyperæmia of the mother, who was predisposed to hepatic derangements; hence, the bilious disorders, jaundice, albuminuria, loss of blood, and serous discharge from the uterus, which had so repeatedly attended utero-gestation," . . . and which "ushered in a train of abnormal changes injurious to the healthy relationship between the fœtus and the mother."

In Mr. Tait's case, the mother was 36, and had borne 6 children previously; liquor amnii was in large excess; fœtus attempted to breathe, but apparently failed to fill its lungs; was examined by dissection in four hours after birth. Body excessively œdematous; age computed at 7 months; abdomen enormously distended with fluid, which under the heat-test became a solid cast; no appearance of inflammation in peritoneum, pleuræ, pericardium, or tunica vaginalis testis, although all were dropsical. Cause attributed to premature closure of the foramen ovale of the heart, there remaining only a minute crescentic valvular opening, one-twelfth of an inch in its longest diameter.

Dr. James Sawyer, who conducted the examination of the heart, remarks: "I have especially examined the condition of the foramen ovale in a large number of children's hearts, and I have very frequently found the closure of the opening no more complete than in this case, even in children who have completed their first dentition, and in whom no signs of admixture of the blood of the right and left sides of the heart could be discovered." The placenta was large and œdematous, but not otherwise abnormal; the case is a very rare one.

Note on a Diseased Placenta. By Lawson Tait, F.R.C.S.—Mother 26; 5th pregnancy, two ended in miscarriage, and one was premature. Fœtus in fifth labour fully matured and well-grown, presumably dead, but not stated. Placenta small, and two-thirds *atrophied*, no fatty degeneration. The disease believed to exist primarily in the mother, and not in the placenta. Mr. Tait doubts the existence of fatty degeneration in the placenta, and says the appearances taken for it are never seen in the fresh placenta, and are the result of commencing molecular change due to decomposition.

Segmentary Deposit of Pigment in the Mammary Areolæ. Exhibited by Dr. Goodson.—Girl 18; 7 months pregnant, under treatment for chorea. A portion of skin on either breast to inner side of nipple unchanged in colour; balance unusually dark. Chorea commenced prior to pregnancy. Irregularity of deposit, believed by Dr. Barnes to be due to the irregularity of action in the nervous system, connected with the choreic condition.

Case of Cæsarean Section for Deformed Pelvis. By Dr. James W. Oswald.—Woman 29; deformed by rickets; 4 feet high; conjugate diameter of super-strait, 1¼ inches; operation performed on first day of labour; fœtal

head impacted, delivered it by forceps; uterine wound closed by carbolized catgut sutures; little hemorrhage. Woman died in 62 hours. External wound healthy; cat-gut sutures all untied; about a half-pint of sero-sanguineous fluid in peritoneal cavity; no traces of peritonitis; abdominal organs generally healthy; clot in right ventricle of heart extending about half an inch into pulmonary artery, and continuous with clot in right auricle; lungs congested, masses of consolidation at apex of left, which was contracted to about a third of its normal size. Uterus showed no evidence of disease.

Dr. Routh, who performed the operation, attributed her death to septicæmia and heart-clot, the former originating in the failure of the ligatures, and consequent escape of uterine discharge into the abdominal cavity. He expressed the opinion that, with silk, or silver sutures, the patient might have been saved.

Dr. Meadows reported that in a case where he had used carbolized catgut sutures, the same giving way of the sutures, and consequently fatal result occurred. There is a decided difference of opinion as to the value of sutures in the uterus; but there is no question that in atony or inertia, the result of prolonged uterine action, the silver suture is all-important to the saving of life. Because women recover where no sutures have been used, is no argument against their being employed in many cases, especially where the uterine wound bleeds freely, the woman is exhausted, or the incision is not greatly reduced in length, and closely shut up by muscular contraction. By the use of six of these sutures, Dr. H. C. D'Aquin of New Orleans, in 1867 (see *N. O. Med. and Surg. Journ.*, July 1868), saved the life of a woman who had been in labour ten days, in whom the uterine wound bled freely, and the uterus failed to contract, so much so that its right side fell in. With a putrid fœtus in the uterus, a labour of ten days, pulse of 143, and respiration of 26, there was no hope without a close mechanical approximation of the uterine incision. Four years after the operation, there had been no inconvenience experienced from the sutures. The result in sutured cases in the United States, even after long labour has exhausted the woman, leads the reviewer to advocate the use of the silver wire cut closely, and bent down flat upon the uterine wall. A post-mortem examination, made long after such an operation, revealed no appearances of peritonitis. The wires were covered in with newly organized tissue, the result of inflammatory action around each suture; but other than this, there had been no peritoneal change. Linen sutures were used with success in one case after a labour of 62½ hours (*N. Y. Med. Record*, 1868). The usual gaped appearance of the uterine wound, and the presence of uterine discharges in the abdomen, found in post-mortem examinations after Cæsarean operations, satisfy us of the importance of using uterine sutures. R. P. H.

ART. XXIV.—*Seventh Annual Report of the State Board of Health of Massachusetts.* January, 1876. 8vo. pp. xxii., 551. Boston, 1876.

THE general Report of the Board refers with pardonable pride to some great sanitary reforms brought about through its labours. Through the success of its abattoir system, an entire suburban town has been transformed from a disgusting and unwholesome nuisance into a healthful and attractive place of residence. And an enormous pork-packing business of extreme importance to the commerce of the city has been so admirably regulated that there is no

longer any shadow of a fear that sanitary considerations may require its destruction. These are indeed proud achievements.

It is a pleasing evidence of harmonious co-operation for the public good, that the State Board requests to be relieved from the further supervision of the Boston abattoirs, by the transference of these to the charge of the Municipal Board, now fully organized and efficient.

The appointment of a State Engineer, to advise the Legislature, and to provide for the towns which may consult him the necessary counsel and information as to water-supply, sewerage, etc., is a suggestion which seems to us a wise one. It would tend to secure harmony of action between different public undertakings and prevent one community from injuring another. The remuneration of such an officer is recommended to be made by the parties consulting him. Some other recommendations here made we will return to after noticing the special reports on which they rest.

The feature of this Report which overshadows all others, and gives it this year an especial value, is a special report or series of reports prepared in compliance with an Act of the General Court. This called for the full investigation of water-supply, drainage, sewerage, pollution of streams, utilization of sewage, etc., as affecting the health and prosperity of the State. The existing and increasing contamination of the waters of the State was the motive of the legislation.

Accordingly, as a foundation for subsequent labour, the Board caused to be made a most thorough examination of the most densely populated river-basins and principal water-sheds of the State. This work was entrusted to Mr. James P. Kirkwood, C. E., of Brooklyn, N. Y., a gentleman of unusual experience and knowledge of sanitary engineering. Careful surveys were made by himself and three assistants from which maps here printed were prepared, showing the limits of all the different water-sheds. Then in regard to five particular basins, the exact location, amount and character of pollutions entering the streams was determined with the greatest possible exactness, and here recorded in tables and indicated on separate maps. One important table, too, shows for each river, the area of its basin, its population, number of mills and of operatives, the daily flow of water, and other particulars, giving the like facts for several English rivers and river-basins as standards of comparison.

After some consideration of the evidence proving that polluted water injures health, and of the real or apparent contradictions to this general rule, Mr. Kirkwood proceeds to estimate the precise amount of each refuse product which results from a certain given production in different kinds of manufactures. Thus, the making of a thousand tons of wool into cloth necessitates the removal or the destructive use of so many tons of grease, so many of soda, so many of pig's dung, so many of urine, and so on. And so for every prominent manufacture, all chemicals and other agents used are enumerated, and the waste-products thence resulting are estimated with careful discrimination. We are assisted in forming some idea of the influence of contaminated water on health by experiments, here quoted, upon fish, with very dilute solutions of the principal acids and other chemicals discharged from factories.

Now follow series of tables, for each of the selected water-courses, showing number and kind of factories draining into it, with number of operatives, and all data necessary to the correct estimation of pollution. These same facts, together with drainage area, for numerous points higher up-river, or on its branches, are also exhibited in more condensed form. Analyses of water taken from all these same points, complete the tabular presentation of results. Sug-

gestions for improvements, general observations on sanitary characteristics, and facts insusceptible of tabulation, are given in connection with each basin.

In some general conclusions, Mr. Kirkwood takes strong ground against polluted water. He fully agrees with the opinion of an English commission on rivers-pollution, that *water once contaminated with sewage can never after be trusted as perfectly safe for human consumption.* Sewage proper, often to a large amount, enters these same rivers which are recipients of factory waste.

How to protect and relieve the streams from this fearful influx of abominations, is the problem the solution of which is desired by the framers of the Act creating this investigation. It must be confessed that the difficulties of the question have not been very fully met, or rather, have not been conquered. Violent and revolutionary measures, if such were practicable, are not demanded as yet by any magnitude of recognized evil results. The central authority, if such be created, must point out in each particular case the means of cure, before it issues imperative commands. The neutralization or removal of harmful waste matters from fluid refuse, and the purification of sewage proper by irrigation, seem to be the directions in which the writer looks for relief.

The second portion of this special report is by Dr. Frederick Winsor, who considers "The Water-supply, Drainage, and Sewerage of the State, from the Sanitary Point of View." It aims especially to show by observation and by testimony, how and where, throughout the State, sewage is endangering health. Circular letters of inquiry addressed to correspondents of the Board received answers from 188 towns, and supplied much of the information here used. Before using the replies thus received, Dr. Winsor describes and illustrates some methods of removing excrement which have been more or less widely tried. He seems to favour a "pail-system" used with dry ashes.

The water-supply and system of sewerage of forty-six cities and towns having aqueducts is exhibited in a tabular form. The outlet or disposal of sewage is also shown. Of towns reporting no systematic carriage of sewage, 123 report from one-half to the whole of it as discharged into or upon the surface of the soil.

It should be noted that the medical correspondents who have answered the inquiries sent them are presumptively those whose opinions would possess the most value. And so generally do they represent the more populous districts that the communities for which they speak do actually contain 84 per cent. of the whole population of the State.

Nearly one half the answers mentioned offensive odours from sewage. Twenty-four observers connect the prevalence of definite disease with sewage. Several others suspect an evil influence on the health of their neighbourhood from this cause. Sixty-five, on the other hand, report bad odours without resulting disease.

The pollution of wells by sewage is reported by ninety correspondents, of whom sixty-three connect therewith definite production of illness. Of the latter, forty-four reports were of typhoid fever, often several cases to each foul well, as once for instance twenty cases.

Two lists are given of towns delivering sewage into streams and ponds. The first contains those instances in which the medical correspondent considers the results of this disposal as satisfactory, and the second, those deemed unsatisfactory in results. The latter category is slightly more numerous, and represents proportionately a much larger population. Dr. Winsor takes occasion to remark that the evils will naturally tend to increase; and that the most dangerous pollutions are undiscoverable by examination. The same degree of im-

purity, too, which may be borne by a strong man, may poison a feeble one; and even the former may succumb in time to an influence long resisted.

The question as to the effects of changing brooks into covered sewers, brings out some interesting information. Dr. Winsor is probably right in believing that the only safe course is to have two conduits, one perfectly tight for the sewage, and another but partly closed to carry off the natural moisture and drainage of the soil.

Of one hundred and twenty-eight towns reporting many damp cellars, ninety-seven find this condition productive of disease. Bronchial and pulmonary complaints, with rheumatism, particularly subacute, are oftenest mentioned.

Detailed reports are given from several correspondents. One concerning Boston contains a map showing present sewer outlets, and the grand and expensive system recently proposed to obviate the very grave and radical defects of the existing sewerage. Others are extremely instructive to the sanitary student, and full of warning to the people.

In a third part of this special report Secretary Folsom deals with the difficult subject of the "Disposal of Sewage." He has very recently visited Europe for the express purpose of qualifying himself for the intelligent treatment of this all-important matter.

After some general introductory matter Dr. Folsom passes to a brief examination of English legislation concerning sanitary matters, and a sketch of the history of systematic sewerage, as it arose in that country. He here finds striking examples, both of improved health and lessened death-rate among large bodies of people, through water-supply and sewerage, and of sickness and increased mortality sometimes caused by systems badly devised or imperfectly constructed.

The earth-closet and the ash-closet systems, we believe, are very fairly judged by the writer. While they can be so managed as to give immunity from the evils of open privies, and while of undoubted applicability in certain limited fields, they are yet wholly unadapted to the uses of large cities and of careless and ignorant people. In exceptional circumstances, these appliances are admirable; but as a method of solving the great problem now before us, they are utterly valueless.

Water-carriage is believed by Dr. Folsom to be, at present, the only practicable method of removing sewage from densely populated communities.

Considerable information is given us, as to the nature and working of the vacuum system of Capt. Liernur. Evidently Dr. Folsom does not regard this system as adapted to the wants of our large cities. We judge that, like the "earth-closet," it requires an impracticable degree of care, forbearance, and judgment; and besides, a very large original outlay. It should be remembered that the conditions of the sewerage problem in Holland—often actually below the sea-level—are wholly different from those of American cities. In cities below tide-water, the Liernur plan may be the only one practicable, and, therefore, desirable at any cost.

Many different plans for precipitating, purifying, and disinfecting sewage are described, and their practical working shown by the actual experience of English and continental towns. They have not proved economic successes, nor wholly satisfactory otherwise.

As to sewage irrigation, Dr. Folsom has brought together the results of a very large number of British and continental experiments, under very varied conditions. The teaching of these seems to be, that when adequately and intelligently planned and skilfully managed, sewage irrigation can be conducted without offence, without any danger to health, with the result of entire purification of the effluent water, and, to say the least, at an expense not inordinately

great. Where the processes have failed to attain the full measure of success, the reason of failure has been shown, and the remedy suggested. We do not suppose it can be absolutely proved that the effluent water in the most successful cases is surely free from the germs of cholera or of typhoid, but it answers high tests of chemical purity, is drank by animals and men, is harmless to fish, and has retained its clearness and sweetness, when bottled, for a year.

Dairy-farming seems to be indicated as probably the most profitable kind, in using the sewage irrigation. Cattle are healthy, and the milk and its products are every way faultless. The direct produce of the soil is wholly free from any disagreeable or unwholesome quality. It will be remembered we are speaking of things as Dr. Folsom found them in the properly planned and well managed irrigation systems.

The extreme cold of our northern winters will doubtless somewhat interfere with this method of purifying sewage. Still, the experience of Dantzic, on the Baltic, with a climate very like that of Massachusetts, indicates that the evil is much less than would be expected. With a sufficiency of divided plats of land, to be ploughed in the spring, no great trouble need result from some surface accumulation during hard frost. Even at the temperature of zero, however, liquid sewage sinks into the ground.

It would have been interesting to know the exact financial results, in the best English experiments; but Dr. Folsom merely tells us that of forty-four English towns using sewage irrigation, not one recovers expenses. From our severer winters, and our more dilute sewage, he anticipates a still less favourable showing for American towns. But for our inland cities, remote from large rivers, something must be done, and that speedily, He justly says that we cannot wait for some great discovery to be made by the chemists, which shall cheaply cleanse our sewers from their perilous stuff. Hence, he counsels experiment upon this system, in the cases where relief is most urgently called for, and where the conditions seem most adapted to its success.

The concluding portion of this instructive report consists of a brief "Summary and Recommendations," signed by the entire Board, and by the gentlemen conducting the special inquiry. Much stress is laid upon the injury to health arising from dampness of soil, under and around the dwellings of the people. This is indicated by the great number of damp cellars, with consequent disease, so generally reported. Thorough drainage is insisted upon, as a duty of individuals and of towns. For isolated houses and small towns, the speediest and least offensive removal of filth and slops possible in the circumstances, to a distance and to cultivated ground, is urgently advised. Systematic water-supply should be at once accompanied by regular and well-built sewers. Legislation is counselled prohibiting any additional discharge of sewers into water-courses or ponds, without purification by irrigation. Other formal recommendations are made looking towards the practical application of the ideas embodied in different portions of the report.

The whole of this special report occupies two-thirds of the volume, is profusely illustrated with charts and plates, and forms perhaps the most important sanitary paper ever issued in this country. Dr. Folsom's contribution especially is of great value and interest.

To glance briefly at the usual sanitary essays and papers making up the general Report, we have two or three most curious and instructive instances, from the experience of Dr. H. I. Bowditch, of the terrible penalties sometimes exacted for the violation of sanitary laws in country houses.

Mr. Edw. S. Philbrick, Civil Engineer, has a paper upon "Defects in House Drainage, and their Remedies." While much attention is given to the special

conditions of Massachusetts climate and customs, this essay might prove very valuable to any one wishing to build or alter a house intelligently. The ignorance, and the wilful unfaithfulness, of builders, plumbers, and other artificers, of which sad instances are here cited, render it indeed almost a necessity for every house-holder to know how work ought to be done, and then see it so performed. Could not the Board do much good by printing large editions of single papers like this, and that of Dr. Bowditch, and some others, for popular circulation at a low price?

Dr. A. H. Nichols describes a serious outbreak of intestinal disease among boarders at a summer hotel, from the use of very foul ice.

Dr. F. W. Draper reports the commencement in Massachusetts of a movement which is to become of incalculable importance to the public weal. Registration, not of deaths but of diseases prevalent, has there for the first time been attempted. A large number of the best known and employed physicians throughout the State consented to make a weekly report, in an extremely simple form, of the maladies most common, with a mark to indicate general character as mild or severe. Even as exhibited by the first short experience of 1875, the results are very curious and instructive, and have "surpassed the expectations of many who were interested in its trial."

The usual report upon the "Health of Towns" and two or three from particular towns, contain matter of considerable interest, especially as concerning diphtheria. Dampness and filth, together, seem to have been powerful predisposing causes of the disease. Once started, contagion and infection have aided its increase.

The pressing need for Boards of Health, other than the civil authorities acting as such, is emphatically stated, for every town in the Commonwealth.

B. L. R.

Art. XXV.—*Statistics, Medical and Anthropological, of the Provost-Marshal-General's Bureau, derived from Records of the Examination, for Military Service in the Armies of the United States during the late War of the Rebellion, of over a million Recruits, Drafted Men, Substitutes, and Enrolled Men.* Compiled under direction of the Secretary of War. By J. H. Baxter, A.M., M.D., Colonel and Chief Medical Purveyor United States Army, late Chief Medical Officer of the Provost-Marshal-General's Bureau. In two volumes, 4to. pp. lxxxvii., 568, and xxviii., 767. Washington: Government Printing Office, 1875.

This work is a magnificent contribution to our exact knowledge of man. Founded on carefully recorded examinations made by scientific observers, grouped and analyzed with admirable skill, it adds another notable example of the beneficent results which often flow from great calamities. Taken with other Governmental medical publications, it well justifies the wise and witty reference, by a recent writer in this Journal, to the famous riddle propounded by Samson to the Philistines. And surely neither biblical nor heathen athlete ever attempted a more tremendous labour than must have been here encountered in assorting and arranging the collected matter in such manner as to exhibit the millions of facts in all their different aspects and in forms available for use.

The introductory chapter of the first volume sets forth the plan and scope

of the work, exhibits the instructions to recruiting surgeons under different governments, and gives an outline of the history of anthropometry.

It should be noted that the examinations here recorded are not those of a special class, such as volunteered at the outset of the war. They are those of drafted and enrolled men, substitutes, and volunteers, after three years of fighting. They include alike the rejected and accepted. Thus they represent the general adult male population fairly, and were made, too, not under direction of the individual States, but of the national government. Indeed, only about one-half the records of this period are used in this work. The others are omitted on account of incompleteness; and this condition was most common before the special medical branch was added to the Provost-Marshal's Bureau, in January, 1864. We have thus complete and trustworthy records of over half a million men.

In Part I. we have a "Review of the Tables and their Results." Placing this before the tables themselves seems at first unnatural; but the plan has its advantages, among which is the collection of all the reading-matter into one volume, leaving the tables proper—exclusive of some charts and maps soon to be described—to compose the second.

In this "Review" we find explanations of terms and classifications, the disease nomenclature employed, and the kind or degree of special disabilities which was to be productive of rejection. The enrollment, we are told, was made for each congressional district; and many of the tables preserve the same division of the men concerning whom facts are presented.

The half-million measurements of height, of chest circumference, and of weight, are stated to be thoroughly trustworthy. They were made by sworn and experienced officers, with no motive to evade their duty, and provided with all proper appliances. Not quite so trustworthy, it is said, were the larger figures amassed and published by the Sanitary Commission. These were largely obtained from State records from measurements made, if made at all, under circumstances of intense desire to fill up regiments, and a feeling on the part of officers and surgeons from civil life that no man should be rejected for an inch or two. Heights too were generally measured in shoes. Thus the present work, as a contribution to anthropometry, is believed to be much more correct.

These measurements are not vitiated by the too common error of being drawn from some one class only. They embrace men of all conditions and avocations, and this alike whether they were accepted or rejected as soldiers.

Some very curious facts revealed by the stature-measures, give rise to ingenious speculations, but cannot here be dwelt upon. Roughly speaking, Americans were found about an inch taller than English, Irish, and Germans.

Chest-circumference cannot be discovered to present any fixed relation to stature, when we compare race with race. But among native Americans, the two preserve an exact and almost invariable ratio. A similar relation is revealed in the examined men of other nativities.

Greatest growth would seem to be attained somewhere between the ages of thirty and thirty-five, or even above thirty-five, among our northern and western native citizens.

The formulæ of Brent, approved by Dr. Hammond, for determining the relations which should obtain between chest and stature, are shown to be largely in error.

The degree of expansibility of the chest varied very greatly and with little relation to its circumference. One youth weighing 114 pounds had a chest measure, at expiration, of 29 inches, but could increase it on inspiration to 36 inches. Another, slightly taller and heavier, could raise his expiration girth

only one-half an inch. He was rejected for trouble in one leg. Great expansibility of chest so frequently was accompanied by hernia as to point to some relation between the two facts. The mean mobility, for the half-million, is 2.781 inches; for 300,000 white natives, 2.807.

Statistics of weight were not required of the examining surgeons. Some, however, chose to record this fact also. The information gained from this source and from others indicates the incorrectness of the popular impression that the typical American is lacking in the weight proper to his stature.

About two-thirds of the men examined were described as blonde, the proportion being a trifle larger among foreigners than natives.

Many most curious and instructive points in this chapter we must regretfully pass by.

Part II. is made up wholly of charts and maps, with very brief explanatory comments. Charts of Class First exhibit to the eye the proportionate magnitude of certain prominent diseases as causes of rejection. Thus the first chart in this class shows by shaded spaces parallel to a divided scale, chronic rheumatism as a cause of rejection of the married, of the single, of the blonde, of the dark, of men in each different age-period, of men of different heights, and of natives of different countries. Opposite these different descriptions of men, between them and the shaded blocks mentioned, is given in numerals the absolute number of each description examined, and also the number rejected in each thousand (of that description) examined. The next score of charts shows the same facts regarding a score of other diseases or classes of disease. They are admirably clear and well executed.

Class Second consists of some half-score of charts constructed like those just described, except that occupations of the men examined take the place of nativity, age, social condition, etc. Some very curious results are here revealed, of which some can be explained by a little reflection, while others are very puzzling.

Class Third is made up of charts showing for the different States the same relations to groups of diseases as have been before shown for nativity, etc., and occupation.

Lastly, we have two charts exhibiting the relations of stature and of chest-girth, to age and nativity.

A dozen maps of the loyal States, beautifully tinted and shaded, exhibit for disease in general and particular classes of disease, their comparative efficiency, in different congressional districts, as causes of rejection of drafted men. Thus hernia, as a reason of rejection, is indicated upon a map of the whole country, coloured pink, in five different shades, with such diversity of fine lining as make them perfectly distinguishable, and expressing respectively ratios per thousand rejections, of less than twenty, twenty to thirty, thirty to forty, forty to fifty, and fifty or more. So, disqualifying eye-disease is shown in five tints of blue, upon another map. And so for others.

Part III. of this volume is quite different in character from the rest. When the war ended, circular letters of inquiry were sent to the examining physicians in all the districts, inviting a general report of their experience, and of all special diseases or special physical characters attaching to their districts and their communities. They were asked to mention how many men they could examine daily, what changes they would advise in the instructions or the causes of exemption given them, and what methods of deception or obstruction they had encountered. The replies possess much interest and value, but do not call for special notice here. We are glad that they are thus preserved. Should future generations ever be unhappily compelled to raise immense armies,

they may profit by the exposure of errors and weaknesses of which we of to-day do not need to be told.

The volume ends with a general index to the entire work, which appears to be full, and we presume accurate, judging from the care and labour evidently given to other portions of the work.

The second volume is wholly made up of tables. Of these a little more than half exhibit measurements and physical qualities in their relations to race, age, etc., while the others deal with the diseases causing rejection, in their manifold relations. As these are merely the full and original statements of the facts which we have described as exhibited more agreeably in the beautiful charts and maps of the first volume, we need only add that they show the same clearness of statement and felicity of arrangement. The whole work seems to be well done; and extremely creditable to Dr. Baxter.

The book is a monument of almost incredible labour, of a sort little appreciated by the world. Its author may, however, safely anticipate an enduring and wide-spread fame, if not the noisy but transient plaudits which reward lighter toils. B. L. R.

ART. XXVI.—*A Manual of Percussion and Auscultation; of the Physical Diagnosis of Diseases of the Lungs and Heart and of Thoracic Aneurism.* By AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine and of Clinical Medicine in the Bellevue Hospital Medical College, etc. etc. 12mo., pp. 255. Philadelphia: Henry C. Lea, 1876.

DR. FLINT'S well-earned reputation will secure for any book coming from his pen a cordial reception by the medical profession, but this little manual of auscultation and percussion has substantial claims of its own to favour, which would without this advantage render it popular. It is not unlikely that it will occupy the same place in the English language which the excellent manual of MM. Barth and Roger has so long filled in the French.

The work contains, the author tells us in the preface, the substance of the lessons which he has for many years given in connection with practical instruction in percussion and auscultation to private classes composed of students and practitioners. The plan is simple, his experience in teaching having shown him the importance of avoiding all unnecessary refinement. It has also convinced him of the necessity of the student's becoming thoroughly familiar with the physical conditions and signs of health before he attempts to study those of disease. The author therefore devotes a large part of the book to the consideration of the former. That this is the only plan of teaching which will ever be attended by success, no one will have the hardihood to deny, and yet how often in practice does the student in this country receive his first instruction in auscultation and percussion at the bedside of the sick.

The book is, we repeat, an admirable one. Few physicians since Laennec have rendered as valuable services in the field he has specially cultivated as Dr. Flint. It is not necessary to mention these in detail, since they have been for the most part appropriately noticed in the reviews of his larger works, which have appeared from time to time, in the pages of this Journal. In our opinion his observations in regard to the importance of pitch as a distinctive character of the sounds obtained by auscultation and percussion is the most valuable addition made in recent years to our knowledge of the physical signs of disease of the chest. J. H. H.

ART. XXVII.—*An Elementary Treatise on Diseases of the Skin, for the use of Students and Practitioners.* By HENRY G. PIFFARD, A.M., M.D., Professor of Dermatology in the University of the City of New York, etc. 8vo. pp. 375. New York: MacMillan & Co., 1876.

DR. DUHRING has furnished the Medical Profession with the first American Atlas of Skin Diseases, but his complete treatise upon this subject has not as yet left the hands of the publisher, while previous attempts in this direction by American physicians, prior to the recreation of Dermatology by Hebra, are of necessity so meagre in outline and so unsatisfactory in matters of practical detail that they can hardly be considered as appertaining to the science of to-day. To Dr. Piffard then is due the credit of the first venture upon a sea as yet, by Americans, untraversed. Upon every new book rests, however, a certain *onus probandi*. It must not only give a reason for the faith which is in it, but is also actually called upon to furnish a satisfactory individual *raison d'être*. This it may do in three distinct ways. Its object may be the promulgation of truth as yet unknown. It may be the wider dissemination of truth which is for various reasons practically unobtainable by the majority. Or, finally, it may be, by compilation, selection, and condensation, to furnish a means of ready reference, and of obtaining a general knowledge of a subject, to those whose time is limited, or who demand but a superficial acquaintance with the subject matter under consideration. Dr. Piffard modestly contents himself with claiming only the last of these reasons, his object being, by availing himself of the classic literature of the subject and adding thereto his own personal experience, to furnish a volume which may serve as an introduction to the more elaborate works upon dermatology, as an elementary guide to the student and a manual of reference to the general practitioner. In his dedication of the book, however, he foreshadows more boldly the subsequent expression of certain original conceptions, wherein he stands alone among the dermatologists of this country, in that he lays claim to special opportunities for the pursuit of lines of investigation and research usually impracticable. Unusual opportunities call for exceptional results, and Dr. Piffard evidently courts criticism. But an architect may build better than he himself knows, even though he fails in precisely the points in which he takes most pride, and the field of dermatology in America offers most certainly the occasion, if the author does but avail himself of it.

The first chapter of the book is devoted to the anatomy of the skin. Its descriptions are good and clear, concise, and yet full enough. It is illustrated by wood-cuts, which are excellent, and by one photo-micrograph. Of these last there are five in the whole book, and, though good of their kind, they are yet not of the class of illustrations best adapted to a book intended to fulfil the end of being a guide to the student and general practitioner. Under all circumstances photo-micrographs labor under the disadvantage of lack of clearness. They have no sharpness of outline. If the lens is of sufficient magnifying power to give a representation of quantitative value, the quality is interfered with, since all parts of the object to be depicted, lying as they do in different planes, cannot be represented at the same time with distinctness, and the result is a blurred picture, with inferior perspective. Nevertheless, as there are but five photo-micrographs in this work to forty-nine wood-cuts, we should be sorry to even appear to cavil. The wood-cuts are also judiciously selected, partly from the works of well-known German writers, and partly from the anatomical plates of

Sappey. Though the descriptions are good, as far as they go, yet a little more fulness of detail in regard to certain structures, noticeably the hairs, would have perhaps been in place even in an elementary treatise. Though the language is, as a rule, concise, and Dr. Piffard acknowledges having often sacrificed elegance to brevity, this hardly excuses such expressions as "fat vesicles and other organs," distribution of blood-vessels to "fat vesicles;" "medullated" fibres of nerves, etc. Moreover, afar off like a little hand, the cloud of originality already peers above the horizon, and we notice the first slight straining after effect in the propounding of a new and untenable theory in regard to the formation of the horny layer of the epidermis, in defiance of the law, *de nihilo nihil fit.*

The chapters upon physiology, pathology, symptomatology, and diagnosis are sensible, and for the most part clearly expressed, and illustrate well the admitted versatility and the acuteness of observation of the author. And yet there is a marked contrast between the wealth of the armamentarium of instrumental aids to diagnosis in the valuable chapter upon that subject, a wealth possibly even too great for actual utilization by the average student or general practitioner, and the poverty, both as to number and description, of the list of individual lesions in the chapter devoted to pathology, from which list we miss wheals, tumors, excoriations, crusts, and scars, lesions which certainly "frequently concern us."

The sixth chapter is devoted to classification, and it is to this chapter that exceptions will be taken by every American dermatologist. We acknowledge the author's ability, we appreciate his inventive ingenuity, we applaud his enthusiasm, we cannot doubt his honesty, we admit his earnestness, and we object to, and join issue generally upon almost every word in this chapter. The object of the classification is "to enable the student to obtain at a glance a comprehensive view of the subject, to group together affections possessing important common characteristics, and, if possible, to give a clue to their nature, and to render assistance in diagnosis and treatment. It should be based upon a plan which appears to combine to the highest degree these several features, and at the same time, its several parts should be consistent with each other." The classification itself is as follows: I. Diathetic Affections; II. General Non-diathetic Affections; III. Reflex Affections; IV. Local Affections; V. Affections of Uncertain Nature. The defence of this classification is based upon the statement that it is a "natural or etiological system." The first author alluded to in favor of a natural system is Lorry, of France, who, in 1777, divided the diseases of the skin into two principal groups, the first comprising those of internal, and the second those of external origin, a little as if the lesions of the body politic should be defined as criminals of native or foreign origin, omitting entirely any specification of the character of their crimes or of the necessary treatment. Lorry's classification resembles the first step of the infant, and, like that, can hardly be said even to be in the right direction, as it is practically in no special direction whatsoever. The next author cited is Alibert, also of France, and under his teachings (1814), the "natural" system attained its acme. Even here we find it so vague, so unsatisfactorily diffusive, that we feel as if we had obtained the entrée of a society rather than the intimate acquaintance of the individual members composing it. Under Hardy, still of France, this system tottered to its close, wounded unto death by the blows of the more exact science of modern days, and in particular by the accurate observation and sound logical common sense of Hebra, so that it is to all intents and purposes a corpse, which our author would now galvanize into a spasmodically deceptive manifestation of non-existent viability.

The only modern authority actually quoted in favour of an etiological clas-

sification is Liebermeister, whose words apply solely to general medicine. Now a disease, as a conception, is *per se* an entity, an abnormal existing process, and a classification of processes is as different from a classification of causes as from one of results. The sole advantage claimed by Liebermeister for his Jesuitical system is that, though wrong, good may come of it therapeutically, but the fusion of exciting causes and resulting processes, in preference to regarding them as distinct subjects for consideration, is a drawback rather than an advantage. With increased knowledge, we believe diseases in general will be classified upon a histological basis; dermatology, at all events, does not come under the same conditions as general medicine. An individual cause of a general process which evinces itself by many, generally distributed manifestations, varying in their character, differs surely from identical lesions, or symptoms, confined to the skin and due to a special process which might have been set in operation by any one of many different causes. This by no means denies that certain conditions may exist which are simultaneously general and special, that is which affect coincidently the corporeal system as a whole, and the skin as a part thereof. An etiological basis of classification is necessarily unscientific. We have to deal with material elements subject to chemical and physiological laws. External agencies acting upon parents may result in the production in the offspring of inferior material, that is such as is less resistant to the action of the same or other external agencies, or, such agencies may be powerful enough to act deleteriously upon even the best material. The result is an increase, decrease, or alteration of these material particles as to character or position. These results are lesions, and are to be classified as such. The processes of increase, decrease, or change, being abnormal, are disease, and should be classified as such. The causes, if they can be precisely ascertained and selected as individual integers from our illimitable circumfusa, may again, as such, be tabulated and classified. But potential causes, disease processes, and material results must not be confounded. It is precisely therapeutically that the etiological classification is weakest. When our house is in flames we do not stop to institute investigations with reference to the incendiary or other causes.

But our author's classification is not even etiological. Class I. represents Lorry's class of "diseases of internal origin," and unites disease processes totally different and due to various different causes, because the general system may be coincidently affected. This is a question of place of origin of contemporary conditions of existence or of quantitative extension of causation. Class II. represents Lorry's "diseases due to external causes," and is open to the same objection. Class III. portrays, not cause, but manner of approach and action on the part of some remote agency. Class IV. narrates merely the field of action, and Class V. attempts to establish nothing. Such a classification is unappetitiously meagre and absolutely inharmonious. It is based upon a fortuitous concurrence of natural conditions rather than upon an etiological basis, and natural and etiological are no more synonyms than "subjective" and "rational." We leave it to any impartial reader of the book to say whether this classification achieves the objects adduced by the author.

Finally, as to the varieties embraced by these various groups. The terms syphilodermata and scrofulodermata are, both logically and philologically, preferable to the terms "Syphilides and Scrofulides." We object to burdening dermatological nomenclature with new expressions, as, for instance, "Rheumides," "Trichophytosis," "Phytosis versicolor," etc. We can not regard Acne, Rosacea or Xanthoma as justly placed under the head of "Reflex Affections." The weight of authority is against Alopecia areata as a parasitic dis-

ease. It may be doubted if Furuncles, etc., accord with the idea of "Local Affections," otherwise than that they are localized upon the skin instead of upon internal organs. Some of the "affections of uncertain nature" are precisely those of which most is known. We regret the absence from the list of Epithelioma, whether as "exotic" or "rare and insignificant." So also that of the diseases of the hair. The author can hardly be considered as representing the opinions of the American school of dermatology in classing together Lupus, Lupus erythematosus and Rodent "ulcer," and placing them in one category as "Scrofulides."

In the tenth chapter an old friend, or rather enemy, the "Dartre" of the French school, appears with a new face as "Rheumides," although like the Hydra's heads it has repeatedly been destroyed. This term is used to convey the idea of exudation; under this head are placed Eczema, Psoriasis, and Pityriasis, and their existence is attributed to the presence in the skin of the very insoluble products of deficient oxidation.

The remainder of the book is devoted to the consideration of individual lesions, and we gladly turn from speculative theories to more practical details. We should not have felt justified in assigning so much space to the examination of what we hold to be erroneous views except that we felt that the charge preferred against Socrates could be brought with more justice against Dr. Piffard, and that there existed a danger of his doing much harm by instilling false precepts into the minds of the young men who listen to the words from his professorial chair.

The separate affections of the skin are well described; the ability and industry of the author are shown in his advocacy of thoroughly sensible methods of treatment and by the large amount of original work in the line of histological investigation, where, however, the vegetable parasites are conspicuous by their absence. Enthusiasm is manifested throughout by the style of writing, by the independent experimental therapeutics, and by suggestions, modifications, and inventions in regard to instruments. The therapeutical part of the volume is in fact its strong point. It is excellent, and shows good judgment, close observation, and extensive study of other authors. Yet the consideration of the "non-diathetic" affections is entirely omitted, a fact all the more to be regretted on account of the value of the remarks in regard to the treatment of the others. And yet the amount of space devoted to the different lesions is rather out of proportion to their importance, some receiving a too liberal consideration, while the value of the remarks upon others is impaired by brevity of notice. Taken as a whole, however, this part of the work is interesting reading and possesses much merit.

But on page 374, under the heading Vitiligo, there occurs a strange error in translation, to which no reviewer has as yet alluded. In justice to Kaposi, we must call attention to the fact that he does *not* speak of "the use of such blistering preparations as will remove the color from *the rest of the surface*," but merely from the deeply pigmented *border* of the spot of vitiligo. The "rest of the surface" possesses no excess of color, and, by the removal of the dark border of the spot of Vitiligo, the latter, being without color, will present a less marked contrast with the rest of the body than did its pigmented environs previously existing. We might add that the term Ephelis has been dropped as false "etiologically" by most dermatologists, and the term Lentigo substituted.

The type and paper of the book are exceptionally good, though the metastatic nature of the colouring matter of its binding detracts somewhat from the value of the volume as a vade mecum in summer weather. E. W., Jr.

ART. XXVIII.—*Atlas of Skin Diseases.* By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania; Physician to the Dispensary for Skin Diseases, Philadelphia, etc. Part I. Philadelphia: J. B. Lippincott & Co., 1876.

As this Atlas makes the third series of illustrations of diseases of the skin now in process of publication, the others by Fox, in England, and Hebra, in Vienna, the question naturally arises, is there need of such works? No one can answer this question so well as the teacher in dermatology; so that the very fact of their preparation by men of such position and character should be regarded as the most satisfactory reply. It is, in fact, impossible to study affections of the skin properly, unless the eye be afforded the opportunity of seeing just what the teacher attempts to describe by words or book; and no word-painting, however accurate or graphic, can represent the endless and varying minutiæ of colour, outline, and surface change, upon the proper interpretation of which the diagnosis and successful treatment of these diseases so greatly depend. But it is only within these latest years that any sufficient opportunities of clinical instruction in dermatology have become possible in this country, and even now they are to be found in a very few only of our largest cities. In these most favoured centres of medical education, even, the teacher cannot always, or immediately, command the requisite number and variety of cases for the proper illustration of a systematic course in dermatology, or find, indeed, any examples of the rarest forms of disease, of which he has to speak. Even with the most abundant clinical material, other means of illustration, models, plates, photographs of appearances, are constantly brought into service by the most experienced dermatologists in their courses of instruction to students, as desirable adjuvants or necessary substitutes. To the teachers of the scores of less favoured schools of medicine all over our country, portraits of skin diseases furnish too often the only means within their reach of affording tangible proof of the existence of these affections, and to the student of recognizing them, when encountered in his future practice. There can be no question, therefore, of the need of such works to teacher, student, and physician; but of what character shall they be?

The magnificent and costly Atlas of Professor Hebra is far beyond the means of the profession at large; and there has long been wanted a work which should faithfully present the common affections of the skin, in their various forms; a practical handbook of illustrations to accompany the text-book, and which yet should be within the power of every physician or student to possess. Such a want it is the purpose of Dr. Duhring to supply in the publication, of which the first part is now before us. To this end he has selected typical cases of disease, and had them painted and chromo-lithographed by Messrs. Faber and Moras, artists well known in connection with medical subjects. With each picture—which presents the appearances nearly of life-size—he gives a description of the case, with brief, practical remarks upon the nature of the disease, and the appropriate treatment. Four plates will be published at a time, as many, in all, as shall sufficiently represent the more common cutaneous affections in their most important varieties. They will be published in no regular order, and when complete, may be arranged or bound according to any system of classification the owner may prefer.

This purpose has been well fulfilled by the author in the first part. The subjects of the illustrations are judiciously chosen, and the artist's work—

both drawing and coloring—remarkably well done. Two of the affections, eczema (erythematosum), and lupus erythematosus, are especially difficult of representation, on account of the want of prominence of their lesions, while the characteristic forms of efflorescence of the other two—psoriasis and syphiloderma pustulosum—are among the most conspicuous of the manifold appearances presented by the skin in disease. The history of the case, and the description of the lesions represented in the plates are written in an admirably clear style, and the brief account of the nature of the respective affections and their treatment, will make the Atlas in itself a simple and valuable treatise on skin diseases. For a fuller account of his views of these affections, Dr. Duhring refers the reader to his general work on dermatology, to be immediately published.

The Atlas is a credit to the author as a dermatologist, to the artists who have worked so faithfully upon it, and to the publishers for the excellence of its general appearance, and deserves the most liberal support from the profession.

J. C. W.

ART. XXIX.—*Medical and Surgical Memoirs; containing Investigations on the Geographical Distribution, Causes, Nature, Relations, and Treatment of Various Diseases*, 1855–1876. By JOSEPH JONES, M.D., Professor of Chemistry and Clinical Medicine, Medical Department University of Louisiana, etc. etc. 8vo. pp. xviii., 820. New Orleans: Printed for the author by Clark & Hofeline, 1876.

THE object of these memoirs, the author tells us in his preface, is to place in an accessible form the results of his investigations and researches which were begun during his student life at the University of Pennsylvania, and which have been carried on, in spite of many obstacles, ever since. The work, when completed, will consist of three volumes. The contents of the first volume are: Introduction to the Study of the Nervous System; Investigations on Traumatic Tetanus, Epilepsy, Paralysis, and Cerebro-spinal Meningitis; Clinical Observations on Diseases of the Lymphatic and Circulatory Systems, and of the Liver and Kidneys; Investigations and Researches on Pneumonia; Observations on Diseases of the Osseous System. Illustrated by 800 cases of disease, 400 physiological experiments, 95 analyses of the blood and urine, and 60 tables, illustrating the symptoms and mortality of diseases under different modes of treatment and in different climates. In the second volume will be grouped the monographs relating chiefly to Endemic, Epidemic, and Contagious Diseases, embracing Malarial Fever, Yellow Fever, Typhoid Fever, Smallpox, Cowpox, Syphilis, Measles, Cholera, Cholera Infantum, and Dysentery. The third volume will embrace, more especially, the consideration of the diseases and accidents of armies, and such observations on the medical and surgical history of the Confederate Army, as the author was able to make himself or to obtain from the Confederate medical officers. Dr. Jones's reputation as a hard worker and conscientious observer is a sufficient guarantee that the work will be a valuable one—a guarantee, moreover, which the first volume, so far as we have had time to examine it, fully bears out. It is certainly the most ambitious of the medical works printed or published in the South.

Chance, to a certain extent, led us to read the articles on Cerebro-spinal Meningitis and on Pneumonia. The author begins the article on the former of these diseases by a review of its literature. This has led him to the conclusion

that cerebro-spinal meningitis has prevailed at various times and in all countries, and it appears, he says, in its outbreak to have been governed by no fixed laws as to duration, origin, locality, and climate, these having occurred simultaneously in the most widely separated countries presenting the most diversified conditions of soil and climate, and it has attacked alike the most salubrious and healthy towns. He believes, on what, however, seems to us rather insufficient evidence, that cases were observed and have been recorded by Hippocrates.

His observations have convinced him that the disease is more nearly allied to the phlegmasiæ than to the fevers. We shall give his reasons for this opinion in his own words.

"1. Cerebro-spinal meningitis is characterized by true *inflammatory symptoms*, viz.: Increase of fibrin in the blood, elevation of temperature, derangement of digestion and aberration of nervous and muscular phenomena. Unlike the true fevers, the blood is charged with fibrin, and fibrinous deposits are found within and around the inflamed meninges of the brain. 2. Post-mortem examinations in New Orleans confirmed my previous view that the disease consists essentially of an inflammation of the arachnoid and pia-mater of the brain and spinal cord, and that in some cases the structures of the cerebro-spinal centres may be involved in the inflammation. 3. The fatality attending the disease must be referred to the character of the organs involved, and also to the destructive effects caused by the pressure of the coagulable lymph and effusion within the unresisting bony cavity of the cranium and spinal cavity. . . . . 5. The duration of the disease is not governed by fixed laws, as in the idiopathic fevers, as smallpox, varioloid, scarlet fever, and typhus and typhoid fevers, but is governed by the nature and extent of the primary and secondary local lesions."

Holding this opinion of the pathology of this disease, it is not surprising that the author should recommend very active antiphlogistic measures in its treatment, a plan of treatment which, however, experience has shown to be very unsuccessful, and which has been consequently very generally abandoned. The article contains several tables, the reports of many cases, and a chapter on the "Relations of Cerebro-spinal Meningitis to Malarial Fever," and may justly be regarded as one of the most important contributions to the literature of this disease made within several years.

The prevalence of pneumonia in the Confederate Army and the high rate of mortality among the cases treated in the field and in the general hospitals induced Dr. Jones to urge upon Surgeon-General Moore, of the Confederate Army, the importance of a thorough examination of the relative value of the different modes of treatment employed by Confederate Army surgeons. This examination he does not appear to have been able to carry out fully, although he gives us the results of his investigations in a tabular form near the close of his paper. These have led him to adopt, in his own practice, the restorative plan of treatment as the most successful. The statistics which he has collected show that pneumonia prevailed to the greatest extent in the most elevated and northern regions of the Southern Confederacy, and in the armies which were subjected to the severest labours, privations, and exposures. In regard to the relations of pneumonia to malaria, the following are his principal conclusions:—

"Whilst," he says, "the malarial poison cannot be said directly to produce pneumonia, still it is capable of inducing such changes in the blood and in the nutritive and excretory processes, as to dispose the system to this and other inflammations, and therefore the physician should never, in the treatment of pneumonia, in those who have been exposed to the action of malaria, lose sight of its effects in complicating inflammation of the lungs, and of the consequent necessity of arresting at once, if possible, the further action of the malarial

poison. As no remedy can compare with quinia for the accomplishment of this result, its use in the present state of our knowledge appears to be imperatively demanded in the treatment of pneumonia arising in malarious regions, and presenting well-marked and recurrent paroxysms." J. H. H.

ART. XXX.—*A Treatise on the Diseases of the Nervous System.* By WILLIAM A. HAMMOND, M.D., Prof. of Diseases of Mind and Nervous System in Univ. of City of New York, etc. etc. Sixth edition, Rewritten, Enlarged, and Improved. 8vo. pp. 883. New York: D. Appleton & Co., 1876.

THE force of almost any criticism upon a work which has reached its sixth edition seems broken in advance, and if we accept the truly American standard of pecuniary success, the merits of the work before us are undoubted, because its sale has been large. Perhaps, however, there may be some who will look further for evidence.

In the review in this Journal (January, 1872) of the first edition, the "hasty and confident" style of the author is spoken of, and various instances adduced to justify this criticism. Most of these remain in the present edition, although the author says that he "has not failed to take into consideration the suggestions of his critics."

In the introduction, the author describes the instruments and apparatus employed in the diagnosis and treatment of diseases of the nervous system, first of which is the ophthalmoscope, about a page being given to the explanation of its use. He says "the real value of ophthalmoscopy in diseases of the nervous system is in danger of being disregarded through the sciolism of pert pretenders, who read papers and write memoirs without ever having seen the optic disk to recognize it." This may be true, though it does not appear at whom the thrust is aimed; but there are certainly those who fail to discover the close relationship, which the author assumes, between the brain and the optic disk, who are neither sciolists nor pert pretenders.

Various other instruments are mentioned; among them, Dr. Lombard's delicate thermo-electric differential calorimeter. Is the scientific value of results obtained therewith proportional to their apparent delicacy? The thermometer is almost ignored. Is it because it is really less valuable than the more complicated apparatus, or because it illustrates less strikingly the rapid march of "modern science"?

A careful review of the body of this work would be a difficult task, for on every page we find, among solid and valuable statements, sometimes original, but largely borrowed from Charcot and his pupils, Duchenne, Lockhart Clarke, Hughlings Jackson, and many others, all sorts of hasty and inaccurate assumptions and some omissions, evidently depending only upon the hurry in which the book was prepared. Thus under alcoholism, the author says, p. 866, "digitalis is the most active agent we possess as an eliminant of alcohol through the kidneys." Now digitalis is only sometimes a diuretic; no one has shown that it acts specially on the excretion of alcohol, and, what is more to the purpose, there is no reason to suppose that the elimination of alcohol from any of the excretions has anything to do with the removal of its effects. It is burnt up in the body, and the most abundant proof of this fact is easily accessible. On page 872, he directly contradicts what he is repeatedly saying, speaking of the "influence which the bromides exert in *augmenting* the quantity of blood in the brain."

In the next edition we trust the author will tell us whether he has known sciatica produced by pressure from the enlarged prostate (p. 832), and, if so, how large the gland may have been, and what was the shape of the pelvis?

In quotation the author is usually but not always careful. But we notice for Deneffe "Seneffe;" and certain statements in regard to bromide of potassium are credited to Dr. Clarke (p. 873), which really belong to Dr. Amory.

Among the points in which change has taken place from the first edition we observe: "Neuralgia" becomes "neural hyperæsthesia"—a title which has no advantage except that of length, and the disadvantage of being incorrect—since a nerve may transmit or originate much pain (neuralgia), while at the same time its capacity for normal sensations is greatly diminished (anæsthesia). Writers' spasm becomes "anapeiratic paralysis." The classification of the inflammations of the spinal cord has been changed and made to include a large number of separate affections. Catalepsy and ecstasy appear with hystero-epilepsy—the account of which is mostly borrowed from Charcot—under the common head of hysteroid affections. Neuritis (acute and chronic) and tumours of nerves are separately treated of; and a new section has been added on toxic diseases—plumbism, alcoholism, bromism, hydrargyism! arsenicism.

The most remarkable addition, however, is that made to the pathological anatomy of hydrophobia, which was, indeed, prophesied in the first edition.

Dr. Hammond claims to have discovered in the cerebral convolutions, in the pons, medulla oblongata, and roots of the pneumogastric, a condition of granular degeneration, with formation of fat granules, amyloid corpuscles, and nuclear proliferation of the white matter in the anterior and posterior columns of the spinal cord. The accompanying figures illustrating the text we presume to be those published in the *New York Tribune* of July 1st and 7th, 1874.

When a person puts forward a claim to an important histological discovery, or even the confirmation of appearances observed but once or twice before, it is certainly no more than prudent for those who have been unable to see the original demonstration to look for some evidence that the observer is familiar with his subject. Whether other persons have seen in these sections what Dr. H. claims, we do not know: but neither his descriptions of the methods of preparation, his sketches of the abnormal tissues, nor the other products of his pencil inspire us with confidence in the accuracy of his observations.

His methods were not those usually employed by histologists for the nervous centres, the descriptions are meagre and by no means clear; no drawing which is given would enable one to locate the lesions anywhere, and their general appearance betokens either coarse preparation or coarse drawing. Nothing is said of the way in which the sections were made transparent, and if they were not made transparent at all, it is very difficult to understand how they could have been "sufficiently thin." Fig. 91, for instance, which purports to be from the nuclei of the hypoglossal and pneumogastric nerves, gives not the slightest indication of its locality, and looks very little like anything we have seen there in a good many observations of this region.

As to the nuclear proliferation of neuroglia cells, figured on p. 658, there is not the slightest reason to suppose that they came from the white substance of the cord, and a great many to suppose the contrary. In order to have appeared of the size represented, they must have been viewed with a power many times higher than that employed upon the other cells, a fact not hinted at in the explanation (compare fig. 91), and could not have been seen without making the section very thin and very transparent, a process which would probably have removed the fat said to have been found. The "remarkable deficiency of all cell structure," naively noted by Dr. H., is very interesting. We remember to

have frequently met with this phenomenon in the examination of nervous structures during our early days of microscopy. Perhaps the absence of cells in the normal position will account for the extraordinary structures found in the white substance.

The author states that "many illustrations, which can scarcely fail to elucidate the text, have been added, so that the number now exceeds a hundred. Most of them are original; others are taken from the monographs of Duchenne, Charcot, Friederich, Lockhart Clarke, and other French, German, and British authors." Of the illustrations added, 17 are from Charcot and 8 from his pupils, being, of course, among the best in the book. The text, it may be added, is under almost equally great obligations to Charcot and his school. The style, as might be supposed from the mental characteristics of the author, is direct, clear, and positive.

In conclusion, it may be said that the present edition is enlarged, but not essentially improved; or, at least, not improved relatively to the time at which it was written. The faults of the first, we regret to find, are just as glaring in the sixth. The same hurry and incompleteness, the same want of mental digestion, the same hasty assumption of unproved theories, and generalizations from insufficient data, mark the present as the past.

If, however, one wishes a comprehensive *resumé* of the present state of neurological theories and practice, and if himself sufficiently familiar with the subject, or with the work of others to keep him constantly upon his guard, the book will be a useful addition to his library. R. T. E.

ART. XXXI.—*On certain Endemic Skin and Other Diseases of India and hot Climates generally.* By TILBURY FOX, M.D., F.R.C.P., Physician to the Department for Skin Diseases in University College Hospital, Author of various works on Skin Diseases, etc. etc., and T. FARQUHAR, M.D., Surgeon-Major H. M.'s Bengal Medical Service (retired), etc. etc. *Including Notes on Pellagra, Clou de Biskra, Caneotica, and Aleppo Evil* (with five plates). By H. VANDYKE CARTER, M.D. Lond., Surgeon-Major H. M.'s Indian Medical Service, etc. (Published under the Sanction of the Secretary of State for India in Council.) 8vo. pp. 288. London: J. & A. Churchill, 1876.

THE greater portion of the work before us is of the character of a report, the origin of which may be briefly explained. Some four years ago, Drs. Fox and Farquhar, with a view to obtaining more definite information concerning the cutaneous diseases of India, prepared a chart, the title of which—"A scheme for obtaining a better Knowledge of the Endemic Skin Diseases of India"—fully sets forth its object. The scheme was carefully drawn up, and embodied the existing state of European knowledge concerning the diseases considered, in the form of a concise description of the clinical features of each disease. It moreover indicated doubtful points, and the questions to be determined in regard to them, and, in conclusion, asked for replies to a series of questions. Attention was directed to the following diseases: morphœa; scleroderma; frambœsia; Delhi sore; keloid; fibroma; ainhum; elephantiasis Arabum; the fungus foot of India; elephantiasis Græcorum; leucoderma; tinea versicolor; Burmese ringworm; Malabar itch; and lichen tropicus. A large number of copies of the scheme were circulated by the government throughout India, China, Japan, Egypt, Algeria, Norway, Sweden, Canada, the West Indies,

Sandwich Islands, and elsewhere, from whence it was thought likely that valuable information might be obtained. Replies were in time received from a number of medical officers and others throughout these countries, from which the report before us was compiled. A summary of the information received has been made by the authors of the volume, while the more important of the original letters and replies appear in a condensed form as "appendices" to the report.

Having thus given an outline of the work, its scope, and the manner in which it was prepared, we take pleasure in calling attention to the large amount of valuable matter which is to be found within the volume. The information has not merely been collected from the various sources, but has been closely studied and utilized by the authors. From the mass of correspondence, such as must necessarily have resulted from an undertaking like the present, they have extracted the interesting points and have presented them in the shape of readable, short, practical papers. On every page we recognize the evidence of much labor, for to condense intelligibly so vast an amount of material, is a task involving discrimination, time, and patience.

Concerning morphœa, a rare disease, encountered, however, we think quite as frequently in this country as in England, we learn but little. From the various reports, it is indeed questionable in our mind whether the affection is met with at all in India. We presume it was introduced into the scheme merely for the sake of determining one point (which has been the subject of much controversy in England), namely, whether any relation exists between the morphœa of modern writers and the so-called morphœa of leprosy. This, as we view the matter, is a question about which no serious discussion should ever have arisen, for these diseases have never possessed anything in common beyond an unfortunate name. One is a peculiar atrophic affection, met with in communities where leprosy is unknown, the other a well known and not uncommon manifestation of leprosy. We may, however, now state more definitely, on the authority of the report before us, that no connection exists between the morphœa of modern writers (described in the scheme) and the circumscribed, yellowish, macular patches of leprosy. We are glad to see this question at rest, and trust sincerely that it may not be revived. We must, moreover, take exception to the view promulgated in the scheme concerning the relationship of morphœa and scleroderma, namely, "that morphœa and scleroderma are modified phases of the same disease, the former being the more localized and the latter the diffused form of sclerisis." We do not think that the clinical (and certainly not the pathological) experience which has been brought forward warrants such a conclusion. It is true, that some of the reported cases (we have in mind a case presented to the London Pathological Society in Dec., 1869, by Dr. Fagge, which we had the pleasure of seeing) appear to partake of the nature of both diseases, but the majority are either scleroderma or morphœa, and not a compound of the two as the description in the scheme would indicate. The characters of scleroderma are sufficiently well known; those of morphœa, on the other hand, have not been so accurately described. We recognize two forms of morphœa (and it is proper to state here that our views are based upon a clinical experience of eight cases), one characterized by the well known, circumscribed, yellowish, atrophic patches; the other by a variety of lesions, all of which may or may not be present, consisting of pit-like depressions in the skin, bluish or reddish tortuous lines, whitish atrophic streaks (striæ atrophicæ cutis), yellowish or brownish pigmentary deposit, together with one or more centres of disease, reddish or purplish in colour, followed at times by peculiar, yellowish, hard, horny, cicatriform, roundish, or elongated band-like lesions. The process is a very complex one,

and worthy of the most careful study; as yet our knowledge is far too limited for us to arrive at definite conclusions concerning its nature.

From the replies to the interrogations concerning scleroderma, we learn that this disease is very rare in oriental countries, and that it is not met with in connection with leprosy.

Frambœsia, or Yaws, is next upon the list. It is unknown in India. Our knowledge of this disease is derived chiefly from the West Indies, where it is common. An extensive summary of Dr. Gavin Milroy's "Report on Leprosy and Yaws in the West Indies," published in 1873, is given, from which a very satisfactory idea of the disease may be obtained.

The subject of the Delhi sore is taken up with manifest interest, and a discussion of its nature and peculiarities entered into. Concerning its cause but little has been ascertained. It is unquestionably endemic in certain unhealthy localities, as at Delhi and in the surrounding country. From all accounts, the disease attracted no marked attention until 1857, when large bodies of troops were for the first time stationed within the walls of Delhi, numbers of whom, as many as from fifty to seventy per cent., were attacked. The troops stationed at Delhi in 1872 suffered in a like manner. The special circumstances determining the development of the malady are as yet undetermined. In the absence of more definite knowledge, the authors state that "it would seem that the disease is best explained as the result of a vitiation of the nutrition of the body as a whole, the consequence of the operation upon the latter of climatic influences which deprave that nutrition. Delhi sore, in fact, appears to be a local manifestation of a cachectic condition due to residence in unhealthy localities." It appears from the report, that with the institution of sanitary measures of late years, there has been a marked decrease in the prevalence of this disease at Delhi; a strong argument certainly in favor of the cause just referred to.

In connection with Delhi sore we have an able article from Dr. Vandyke Carter on Biskra, Crete, and Aleppo "boutons," disorders occurring at Biskra (in Algeria), the Island of Crete, and at Aleppo (in Syria). Dr. Carter spent some time in these places studying these diseases. From his observations, and the report of Dr. Weber, stationed at Biskra, we learn that Biskra bouton "is a specific, inoculable malady, endemic to certain unhealthy localities, attacking persons of every rank and at all ages, immediately, or at a varying interval after their arrival in the localities of the occurrence of the disease; beginning locally by a papulation, attended with itching, which papulation tends to become an indolent pustule, covered over in time by crusts, and giving place to indolent ulceration of greater or less degree, and covered or not by crusts. The disease may assume a serpiginous form or not. It leaves behind indelible, punched out like cicatrices of dark colour. The 'boutons' vary in number; there may be one or many, and the limbs and face are the chief seats of these 'boutons.' The disease may recur once or more. It lasts on an average six months." It is further stated that the disease attacks animals, and especially the noses of dogs.

At Crete, Dr. Carter, in the course of his investigations, made the discovery that a disease known by the name of "caneotica" existed there, and that it was the same affection as Aleppo evil. It is said that this "caneotica" was introduced into Crete some years since from Syria. From these studies we arrive at the conclusion that Delhi sore, Biskra, Crete, and Aleppo "boutons," are one and the same disease, differing only in minor features. This information is a valuable contribution to our knowledge of oriental dermatology. Four instructive chromo-lithographic drawings by Dr. Carter are given, representing Biskra, Crete, and Aleppo "boutons," from which we obtain a very satisfactory

idea of the characters of the lesions. It has recently been stated[1] that there is in reality no such disease as Aleppo evil; that not only the so-called Aleppo evil, but that all of the diseases of this character are modifications either of syphilis or lupus. We are, however, not prepared to accept Dr. Geber's views until further inquiry and investigation shall have been made. The accurate descriptions of the several diseases given by able surgeons in the volume before us speak loudly in favor of the diseases being specific processes, and not syphilis or lupus. Our conclusions must be drawn, not from the experience of one or two observers, residing in one locality, but from the accumulated evidence of the numerous observers scattered over the various districts in which these disorders are endemic.

The most interesting subject in the report to us, as Americans, is elephantiasis Arabum. The authors have collected and summarized the information received in a manner at once interesting and useful. From the various reports of medical officers stationed at India, China, and elsewhere, it appears that the disease is met with much more frequently in some districts than in others, while on the other hand, in certain sections it is almost unknown. A communication from Mr. Saville, of Hualine, Society Islands, states that it is exceedingly common both there and in the neighbouring islands, so common, indeed, that according to his observations at least seven-eighths of the entire population are suffering from the affection. It is said that it is very much more prevalent now than formerly. This latter observation relative to other countries has been made by other reporters. Mr. Saville, in his paper, goes on to say:—

"Foreign residents are as obnoxious to its attacks as the natives themselves. We have now fourteen Europeans and Americans resident upon the island, all of whom have resided here more than two years, and some more than twenty years. Of these eleven are heavily afflicted with elephantiasis Arabum; three of them in both legs and both arms, one in one arm and a scrotal tumor, another in both of the lower limbs, two in both of the lower limbs and a scrotal tumour, and four with only one of the lower limbs affected. So that only three of the fourteen foreign residents are free from the disease, and in these three I include myself and wife."

This is truly a startling percentage; quite sufficient, we should say, to alarm any one contemplating a sojourn in these islands. The letter from which we have just quoted will amply repay perusal, as indeed will the majority of those relating to this disease. We also take pleasure in referring to an elaborate and valuable paper by Mr. Vincent Richards, of Balasore, India, giving a carefully prepared analysis of six hundred and thirty-six cases of elephantiasis Arabum.

Confining our attention to the striking features of elephantiasis Arabum, we find that it is more common in males than females. In Mr. Richards' cases, the proportions were fifty-nine per cent. males, and forty per cent. females. This percentage is about in accord with the observations of authorities. Concerning the social position of those attacked, it has been found, that, although of more frequent occurrence among the poor and ill-fed classes, those in well-to-do circumstances are by no means exempt. The information received does not point very conclusively to particular occupations suffering more than others, although it is the general opinion that those exposed to the sun in damp regions are especially liable to be attacked. It ordinarily makes its appearance between the ages of fifteen and forty. It is very seldom encountered before puberty. In all of the countries from which communications were received, observers

[1] See an interesting paper by Dr. Edward Geber, in the Archiv. für Dermatologie and Syphilis, Heft. iv., 1874.

agreed that the leg was the region most frequently involved; according to Mr. Richards' paper, it was the seat of trouble in ninety-five per cent. A point of interest in the pathology, is the relation of the febrile attacks, which accompany the disorder, to the local manifestation. Although the reports which refer to the order of the symptoms, and to the relationship of these two sets of symptoms in particular, are somewhat conflicting, we learn that the disease may develop gradually without fever, with or without enlargement of the glands; or, on the other hand, that the first evidence of the disease may consist in a painful and swollen condition of the glands, with fever. The bulk of the evidence, in our opinion, seems in favor of the fever being symptomatic of the lymphatic inflammation.

Concerning the treatment but little new has been brought forward. Change of climate, without doubt, offers the best means of recovery. According to Dr. Fayrer, who has had much experience with this disease, it may be completely arrested if change of climate be instituted in the earliest stages. Surgical treatment is very frequently employed in the East, as here; apparently with more success.

The so-called fungus foot of India, termed also mycetoma, is next considered. Of the nature and cause of this affection, the investigations brought about by the scheme seem to have thrown no light. At the same time, the several reports confirm the view of there being two distinct forms of the disease, as held by the more recent writers on this subject. In one form, there are found in loculi or sinuses in the attacked part, usually the foot, black, "truffle-like" masses of fungus; in the other form, the same condition of the tissues of the part exists, with groups of small, opaque bodies or granules resembling masses of fish-roe, but no fungus. Dr. Vandyke Carter, who has made extended researches into the subject, considers the "fish-roe" bodies to be fungus, and therefore holds that both varieties of the disease are parasitic. This view, however, is not corroborated by other observers. It is maintained by the authors that these fish-roe-like bodies are essentially fatty in nature. The pathology of mycetoma, therefore, still rests in uncertainty.

The nature of the several varieties of disease known by the names of Burmese, Indian, Chinese, Tokelau, and other "ringworms," although long suspected as being forms of tinea circinata, has been involved in obscurity. This doubt has been cleared up in a most satisfactory manner. There appears to be but one opinion among the various observers, and this is that all of these affections are one and the same disease, the tinea circinata of modern authors modified by climate and other circumstances. It is very common throughout India, China, and the East generally, attacking for the most part the poorer classes. It not infrequently assumes remarkable development, and constitutes one of the most troublesome affections to which the natives and others of these climates are subject. According to Mr. Ghosal, of Bankipore, India, it shows itself in three forms. In the first of these the eruption appears as somewhat elevated rings, with slightly raised, papular, red margins. The surface is dry, furfuraceous, and very itchy. When scratched it yields a thin, watery secretion, which continues to ooze for some time. The second form resembles the first in all its characters except shape, which instead of being in exact circles, or rings, is irregular. The third form resembles the second in shape, but is eczematous. There is greater irritation, and scratching is followed by an inflamed surface with vesicles and pustules, and a discharge which dries into crusts. The fungus grows luxuriantly in hot and rainy weather, and withers in winter. It attacks, especially, the inner aspect of the thighs, the back, the pubic region, the buttocks, behind the ears, the nape of the neck,

and the umbilicus; it is rare about the face. It is said that the Indian boatman's back is generally well covered with ringworm.

We have thus drawn attention to some of the more interesting points contained within the volume under consideration. We commend it heartily to all engaged in dermatology, feeling confident that they will find much valuable material within its pages. The work cannot fail to be a means of stimulating the study of this class of diseases throughout the Orient and other tropical countries.

L. A. D.

ART. XXXII.—*International Exhibition*, 1876, *Official Catalogue*. 4 vols. Philadelphia: John R. Nagle & Co., 1876.

IN the preceding number of this Journal we gave a sketch of the medical exhibit at the International Exhibition, made by the United States Government. In this issue we give a brief survey of some of the remaining portions of the general exhibit which are of particular interest to the medical profession.

In the Swedish department there are some medicated leaves exhibited by G. Peltz, of Stockholm, and made according to a plan claimed to be invented by Prof. Almen, of Uppsala. The process consists in pouring the drug used into dissolved gelatine, which is then baked into thin leaves divided by lines into small squares, each corresponding to an ordinary dose. They closely resemble the medicated disks which for some time have been used in ophthalmic surgery, and which have also recently been prepared for hypodermic use.

In the class of periodical literature, the only exhibit made is by Prof. Axel Key, of his well-known *Nordiskt Medicinskt Archiv*, which was begun in 1869, is published quarterly, and contains able contributions from the leading medical minds of Sweden, Norway, Denmark, and Finland. An excellent feature of this journal consists in a summary in French of all the original articles contained in the number. Prof. Key also exhibits, in connection with his colleague, Prof. G. Retzius, the first part of their superb atlas of studies in the anatomy of the nervous system and connective tissues.

Prof. Zander, of Stockholm, exhibits in Machinery Hall a series of apparatus for mechanical gymnastics, consisting of twelve different machines, of which seven are intended for active movements, and five for passive motion. The whole set forms part of the gymnastic apparatus (stated to number fifty) used in the Mechanico-Therapeutic Institute of Stockholm. All those intended for passive motion are worked by steam, and have a scale by which the patient is enabled to regulate their force, and gradually to increase the action of his muscular system, and also to ascertain exactly how much he may have gained in power.

From the educational exhibit we learn that in Sweden there are two universities, viz., Uppsala, the oldest (1477), and Lund (1668), both of which are wealthy, and receive annually large grants from the government. Each contains a valuable library, that at Uppsala numbers 180,000 volumes and 8000 MSS., that at Lund upwards of 100,000 volumes. In addition to the medical faculties of these ancient universities, there exists a third school, the Royal Carolian Medico-Chirurgical Institute at Stockholm, the origin of which may be traced back to the year 1667. This school is also liberally aided by the government, and is under the superintendence of the Chancellor of the University of Uppsala. The number of teachers in this school is twenty-two, of which

eight are professors, five extra professors, five adjuncts, and four docents. The number of scholars averages one hundred.

In the Netherlands exhibit, are a series of plaster of Paris bandages made by Dr. A. Mathijsen, according to his method, first introduced in 1851. It consists in using strips of coarse flannel rubbed on both sides with fine, dry plaster, and then rolled up very loosely and laid in water for a few moments before application.

That, however, which undoubtedly is most interesting to the physician in the collection of the Netherlands and her colonies is the superb herbarium, illustrating cinchona cultivation in Java. The collection comprises specimens of the bark of every variety in all stages of growth, of the wood and leaves, and of the derivative alkaloids. The Dutch Government, actuated by various motives, in 1851, undertook the introduction of the cinchona tree into the Island of Java. The first tree was brought from Paris, where it had been raised from seed imported from Bolivia. In the following year, Dr. J. C. Hasskarl was sent by the Government to Peru, to collect cinchona plants and seeds; and seeds were also obtained from Madras, Bolivia, and New Granada. The plantations in this way begun have prospered exceedingly. At the end of March, 1875, the Government had seven plantations, covering an area of about 1500 acres, and containing 2,020,810 plants. Besides these, cinchona trees have been distributed over the entire Indian Archipelago, and on the Islands of Sumatra and Celebes several small plantations are to be found.

The cinchona calisaya, var. microcarpa Weddel, and the cinchona officinalis are the varieties principally cultivated. The barks of the cultivated cinchonas are found on analysis to contain at least as large a quantity of the alkaloids as those of the same species from South America. Analysis has also shown that the cinchona calisaya, var. microcarpa of Weddel, surpasses all other species in the average yield of quinia. Since 1873, when this bark was first recognized among the calisayas of the Java plantations, the cultivation of all other calisayas excepting it and the C. officinalis has been abandoned. All the trees of the other species will be extirpated as soon as they yield a good crop of bark and the C. calisaya, var. microcarpa will take their place.

We are informed that the cinchona harvest is annually increasing, and that in 1875 it yielded a profit, which, it is confidently expected, will increase annually.

In the Russian department we find some very handsome surgical instruments, made by the Chirurgical Instrument Manufactory, War Department, St. Petersburg, a collection of urethrotomy instruments by Eberman of the same city, and an injector for embalming the dead, by Dr. Wywodzoff, of St. Petersburg.

For the proper preservation of bodies for anatomical or other purposes, Dr. Wywodzoff lays down the following requisites: 1st. That the body shall be preserved in a soft, flexible condition for at least three months; 2d. The tissues should not be changed in colour; 3d. The material used should be neither injurious to the health nor spoil the instruments employed in the operation; 4th. The material used must either be free from odour, or it must have an agreeable odour; 5th. The material must be cheap. These qualifications are possessed by thymol and salicylic acid. Thymol, when combined with animal tissue, preserves it from decay by retarding decomposition; it also possesses deodorant properties, and when taken internally is harmless. The cost of thymol is twelve times that of carbolic acid, but the very small quantity of thymol used to obtain the same effect, makes it a cheaper disinfectant or antiseptic.

Dr. Wywodzoff's researches on the preservation of subjects led him to the following conclusions:—

1st. Thymol, diluted with water and glycerine (℞. Thymolis, ℈ij; glycerinæ, lb. iv; aquæ, lb. ij), is the best preservative liquid which can be used for the injection of a whole body, as well as of separate organs. Like carbolic acid, it evaporates, which enables it to come in contact with the parts which begin to dry after the injection.

2d. Salicylic acid is also a good preservative, but only when it is in actual contact with all parts of the injected tissues.

3d. The quantity of the liquid used must be half the weight of the body.

4th. The success of the injection can be best obtained when the cavities are not opened, the viscera left in, and unnecessary incisions avoided.

5th. The complete injection of a body must be accomplished by slow filling of the bloodvessels; this can readily be done by Dr. Wywodzoff's injector, which is to be seen in the exhibition, but cannot be intelligently described without illustrations. Dr. Wywodzoff claims that the good results obtained are due to the slow filling of the bloodvessels which is insured by the use of this injector.

The results obtained by this process are certainly the best we have ever seen. In specimens, exhibited by Dr. Wywodzoff, several months after injection, the skin retained its original colour, and the muscles and joints were in their natural soft and flexible condition. The method is extremely well adapted for the preservation of subjects for dissection, and we would strongly recommend its trial to all who are engaged in teaching practical anatomy.

In the Austrian department Dr. Politzer exhibits a number of ear preparations which show at a glance the anatomical relations of the parts, and especially the position of the membrana tympani, ossicles, and labyrinth. The normal preparations show—1. The outer and inner surfaces of the membrana tympani with the ossicula auditûs; 2. The bony meatus entirely separated from the surrounding bones, showing the oblique position of the membrana tympani; 3. Vertical and horizontal sutures of the ear, showing the Eustachian tube, cochlea, and vestibule from various aspects; 4. The relation of the semicircular canals to the tympanum; 5. The position of the cochlea with relation to the tympanum; the cochlea being in some of the preparations laid open to show the lamina spiralis; 6. Various views of the different parts of the ear in connection. The pathological preparations are: 1. Calcareous deposits in the membrana tympani; 2. Double perforation of the membrane; 3. A very large perforation, the membrane being almost entirely destroyed; 4. Funnel-shaped growth of the membrana tympani to the inner wall of the tympanum (rare); 5. Separation of the handle of the malleus from the membrana tympani (rare); 6. Extensive calcareous and cicatricial degeneration of the membrane, and growth to the inner wall of the tympanum; 7. Adhesion of the membrana tympani to the inner wall of the tympanum in such a way as to close the tympanic opening of the Eustachian tube; 8. Destruction of the membrana tympani and growth of the lower end of the handle of the malleus with the promontory. Dr. Politzer also shows casts of anomalies in the arching and of solutions of continuity of the membrana tympani. It is unnecessary to call attention to the importance of a knowledge of the state of the membrana tympani with reference to diseases of the organ of hearing, and especially of the middle ear. Beginners meet with great difficulties in discerning changes in the convexity of the membrana tympani and certain forms of solution of continuity, and great assistance is afforded by the demonstration of well-marked pathological preparations. Besides the fact that many changes in the membrana tympani observed during life nearly or totally disappear after death, the small size of the object renders it difficult for the beginner to reconcile the state found after death with that observed during life. Dr. Politzer has, therefore, had

made a series of fifteen enlarged preparations in wax, showing perforations, calcareous deposits, cicatrices, adhesions, granular myringitis, the formation of vesicles, excessive vaulting inwards, etc.

We are happy to learn that these beautiful preparations have been purchased by the Mütter fund for the Pathological Museum of the College of Physicians of Philadelphia.

With the assistance of Dutch physicians especially, the study of medical science has been successfully carried on for more than twenty years at Nagasaki, Japan. In 1872 a medical college, under native direction, was established in Tokio, and has now over five hundred students attending its instruction. Under the stimulus thus given, Japanese artisans have exerted themselves to manufacture the various instruments used in medicine and surgery, and the results exhibited are very creditable to their skill.

From the Chinese medical exhibit, we regret to say, there is nothing useful to be learned. A study of the 756 specimens of their native drugs, vegetable and mineral, carries us back to the therapeutics of the middle ages. For instance, we are told that the common hedgehog's skin is decocted for pulmonary complaints, and is powdered and made into pills which are administered for cutaneous diseases; that a decoction of centipedes is used in gonorrhœa; and that dried human urine is given in pulmonary complaints, possesses demulcent properties, and taken internally is supposed to cure debility. Eggs boiled in boy's urine are also considered by the native physicians very strengthening. A multiplication of these examples would not, however, serve any useful purpose; enough has been said to show that the light of medical science has not yet penetrated the realms of the Celestial Empire. I. M. H.

ART. XXXIII.—*Extract from the Ninth Annual Report of the State Board of Charities of the State of New York, relating to Hospitals for the Sick and Insane. . . . To which is appended a Report relating to the Management of the Insane in Great Britain.* By H. B. WILBUR, M.D.

THE "extract," here given, is simply introductory and commendatory to the report of Dr. Wilbur. We, therefore, pass directly to the latter.

After stating that his recent tour abroad was for the purpose of inspecting some of the British "asylums for idiots and the insane," and that letters of introduction were given him by certain gentlemen in authority with a request to report the results of his observations, Dr. Wilbur adds: "Having, myself, had the charge of a State institution for nearly twenty-five years, and having, in a former visit to Europe, seen something of the management of foreign institutions, I was not unfamiliar with the subject." As in the thirty pages of this essay there does not follow another word about the care of idiots, but, on the contrary, provision for the insane is the sole subject treated, we think the reader unacquainted with the facts, and connecting the above quotation with the subject-matter treated, will be a little surprised when we tell him that the Dr.'s twenty-five years of experience was not in hospitals for the insane, but in charge of institutions for idiots. We may be exceptionally dull, but we wholly fail to see how service in this latter line—honourable and every way commendable as it undoubtedly has been—can have possibly given to the writer any eminent ability to criticise and compare the insane hospitals of his own and other lands. Yet he speaks as one having authority, and is not by undue modesty prevented

from asserting his own private opinion, when, as generally happens, it is opposed to the almost unanimous views of the men really constituting the alienistic specialty in this country.

One point of difference between British and American hospitals, noted by Dr. Wilbur, is the larger proportion of patients regularly working, in the former as compared to the latter. That there is such difference, we have no doubt, though its degree has perhaps been exaggerated. To discuss the subject of employment of the insane would require much more space than we propose now to use. In passing, however, we may mention that no superintendent of American hospitals is at variance with his British brethren as to the great value of labour, as a curative and a palliative, in insanity. The assumption that British patients are quieter than American because they work, rather than that they work because they are quieter, at least lacks proof. Attempts to compel labour have not seemed expedient to American superintendents. Every one knows, too, that there exists among our hand-workers an exaggerated spirit of independence, and an invincible aversion to work not amply requited. The same feelings are imbibed by foreign workmen almost as soon as they touch our shores. Although founded in that noble self-respect which cannot be too much admired, the operation of these sentiments within the wards of a hospital is unfortunate. We believe there is no hospital superintendent in America who does not ardently desire and encourage the general employment of his patients. We hope, however, that our asylum authorities will never assent to the idea recently suggested that they "try to be too safe." We should not envy, for instance, the feelings of a superintendent called to account by a wife, for the death of her husband at the hands of a maniac whom the doctor had provided with an axe or a shoe-knife. We fear no explanation of the benefits of labour would be accepted as sufficient excuse.

Dr. Wilbur fully accepts the views and claims of the extreme "non-restraint" and "personal liberty" party of the British alienists. He speaks approvingly of unguarded windows and unlocked doors; and thinks a few suicides preferable to incessant watching and repression. He finds the Lunacy Board an excellent institution and commends it to American imitation. In short, either by direct statement or by implication, every feature of British management is admirable and superior, everything American bad and inferior.

Without stopping to inquire what reasons, if any, the writer may have for disparaging American management of the insane, we take the liberty of saying that there is among British alienists no such unanimity as he implies, regarding non-restraint, no such blind admiration of their own methods and results, and contempt of American, as he seems to feel. We might add, that the proceedings of the Lunacy Board are often felt, by British superintendents, to be impertinent interference with matters beyond its comprehension. A few extracts and abstracts will show the truth of our statements.

In the *Edinburgh Medical Journal* for December, 1870, is an article entitled "American Hospitals for the Insane, compared with those of Britain." The writer is Dr. W. Lauder Lindsay, F.R.S.E., physician to the Murray Royal Institution (for the insane), Perth. Among the hospitals which he visited were those at Bloomingdale, Flatbush, and Utica, representing corporate, county, and State management. After stating that he came to learn, and to discover whatever excellences might exist, rather than to confirm previous opinions, or to find fault, he says:—

"It must be confessed, that, among alienists in this country, there prevails an amazing kind and degree of ignorance regarding, and prejudice against, American asylums, and everything connected with lunacy affairs in the United

States. The feeling or belief is common at home that, as regards the managements of lunatics and of lunatic asylums, we have nothing to learn from America." Again, "So far from its being the case that we have nothing to learn from the Americans in the treatment of our insane, I will, I think, have no difficulty in showing that, in not a few important respects, they are decidedly (to use one of their own characteristic expressions) 'ahead.'"

Further, after saying that in some particulars American asylums are behind the British, but that he does not design to speak of these, nor of the points in which the two are equally good, he adds:—

"In truth, the less we say of the errors of our cousins (*quoad* the management of their insane) the better for our own reputation for common sense; for the faults of other countries in this respect have arisen too frequently from an excessive confidence in the excellence of the asylums and asylum-system of England, and from too blind a following of her unfortunate example!"

We should like to italicize some of the latter words in this quotation, but will entrust that duty to Dr. Wilbur and our readers.

To sustain his general proposition, Dr. Lindsay enumerates twelve different classes of excellences of adaptation to their work—each heading comprising from one to twenty specified particulars—in which he finds American asylums "stand in favourable contrast to those of Britain;" and "in respect of the non-possession of which the English asylums, and England itself, fall short of that perfection of which they are so much given to boast!" Our readers will please remember that Dr. Lindsay is not the head of an institution for the idiotic, or the deaf and dumb, but for many years practically engaged in the care of the insane. So, possibly, his individual good opinion may fairly balance Dr. Wilbur's condemnation. At all events, we will leave the question of general excellence, and pass to the matter of "non-restraint."

Neither the British Lunacy Commissions, nor Dr. Wilbur, will deny that it is the ability to exercise a certain kind and degree of restraint that gives the hospital a portion of its advantage over the patient's home. Restraint, in most cases, is needed; and so far as the hospital fails to provide it, it fails of its proper functions. So far as moral agencies are effective, certainly they should be preferred. When these fail physical means must be employed. Why, or how, the muscular power of attendants is more curative than the passive force of a sheet, camisole, or bed-straps, we leave to the admirers of the former method. We wish only to show that there are eminent men in the specialty, in Great Britain, who see this matter as we see it; and we would direct attention also to the influences tending to repress freedom of thought and action concerning this subject.

First, we may remind our reader that the late Dr. Forbes Winslow, one of the most eminent alienists of this century, and editor of the *Journal of Psychological Medicine*, repeatedly recorded his dissent from the views lately popular, and his approval of mild restraint in certain cases.

The *British Medical Times and Gazette* for Sept. 26, 1868, quotes with approbation utterances of Dr. Yellowlees, of the Glamorgan, and Dr. Murray Lindsay, of the Derby, Asylums, advocating the occasional use of mechanical restraint; and plainly says that "non-restraint" is often carried to an absurd excess. There are cases, it adds, where restraint is the best possible treatment. It queries whether keeping a man black and blue from constant handling, or stupid with drugs, or debilitated with wet sheets or warm baths, is proper treatment. Confinement by means of a sheet fastened about the body, is thought to be less injurious than holding the patient. Intelligent supervision is mentioned as the grand desideratum, "not inconsistent with a certain amount

of judicious restraint." The same editorial speaks of certain physicians having the "courage to speak out" against the bigotry of non-restraint.

In March, 1869, the same journal commends the paper then just published by Dr. A. O. Kellogg, in the *American Journal of Insanity*, and comments on its "opening men's eyes to the folly of pursuing the non-restraint system to its extreme limits." Similar views are again expressed in editorial remarks in Feb. 1870.

In 1873, Dr. Batty Tuke, of "Fife and Kinross Asylum," says he is convinced that mechanical restraint is much less "irritating and dangerous" than that exercised by hands. Such restraint, and often seclusion, for the patient's good or the common weal, he advocates very strongly.

Dr. Thos. Lawes Rogers, of the Lancashire Asylum, in an address as President of the Medico-Psychological Association, published in the *Journal of Mental Science*, October, 1874, deprecates intolerance on the part of non-restraint partisans; and even admits that gloves, fastened on, may be used with advantage. He would, however, *avoid the use of the word "restraint."*

In October, 1873, Dr. Sheppard, of Colney Hatch, vigorously defended his use of restraining apparatus against the censures of the Lunacy Commissioners. Dr. Yellowlees, of Glamorgan, had occasion to do likewise.

In the *Journal of Psychological Medicine* for Oct. 1875, Dr. J. G. Davey, formerly of Hanwell, and Colney Hatch, in a paper entitled "Reminiscences of Lunacy Practice," says:—

"The right use of both seclusion and mechanical restraint has been and is now somewhat neglected, and this with the sad and humiliating effect of aggravating disease and of adding not a little to the difficulties and dangers of asylum management. The total disuse of seclusion, and not less the entire abandonment of restraint, though advocated by one or more medical men engaged in asylum practice, is, as it appears to me, not only absurd, but sometimes mischievous. . . . . Many a superintendent has, it is to be feared, been ere now deterred from the employment of seclusion and restraint, when one or the other was urgently needed." "The doubtful surveillance of attendants," is mentioned as a poor substitute. Some cases, he says, are aggravated by the constant presence of an attendant.

A case described by Dr. Davey well illustrates a peculiar class, and shows the height of absurdity to which the dominant sentiment has carried the glittering generality of non-restraint. In spite of watchful relays of attendants, a poor demented lady would occasionally fall out of her chair. To avoid the sad bruises thus produced, and give intervals of relief to attendants, the doctor directed a shawl to be bound around both chair and patient for short periods each day. It will hardly be believed, but he was soundly rated by a Judge of Quarter Sessions, and called "guilty of a mean and inhuman economy," "at the cost of a patient's well-doing." So the poor woman was set free to tumble about in the enjoyment of non-restraint, and only the doctor was morally or immorally restrained. In this connection, Dr. Davey quotes an editorial of the *Journal of the British Medical Association*, in which occur these words, ". . . of late years, in Great Britain there has been a steady and powerful reaction against the extreme views of the non-restraint men;" and these views are described as "only fit for *doctrinaires* who do not understand the real exigencies of asylum management." [Such as Lunacy Commissioners and a recent American visitor, we suppose.]

As to two suicides occurring under his own notice, Dr. Davey does not hesitate to speak of them as "sacrificed to the non-restraint system." Two attendants were assigned to each patient, with strictest orders never to lose sight of

their charge. Yet in those moments of relaxed vigilance which will occur, both patients succeeded in hanging themselves. Simple apparatus would have rendered suicide impossible in the time afforded them.

The current number of the *Journal of Psychological Medicine* contains a paper, by Dr. Murchison, assistant at the Dumfries Institution, on Mechanical Restraint for the Insane. He says the blind prejudice against its use is diminishing in England. Some cases within his experience, of terrible self-mutilation, lead him to "question the propriety of the total abolition of mechanical restraint," and to advocate its use in such cases as he has described. May he escape the fate of Dr. Davey, or a worse one! It needs some courage to express, even thus guardedly, views opposed to the Commissioners' dicta.

Dr. Murchison also adverts to the practical unattainableness of perfect watching; and says, that "mechanical contrivances" will be less hurtful to a patient than the alternately lax and harsh constraint of human hands, exerted by "strong and certainly not passionless" attendants. It is his firm conviction, that the great majority of the accidents, and many of the suicides, in British asylums, are due to the disuse of restraint.

In 1869, Dr. A. O. Kellogg, of Utica Asylum, N. Y., visited a number of British asylums. He asserts, plainly, that the innocent restraints forbidden by a false public opinion, and the Lunacy Commissions, are replaced by powerful narcotics, antimonials, "refractory baths" (a sort of wet pillory which he saw in use), protracted seclusion, and other treatment infinitely more injurious than mechanical restraint. Unlike Dr. Wilbur, he did not admire this feature of British management.

Let us now consider for a moment whether the Lunacy Commissions are as excellent things as the writer believes them to be.

Dr. Lauder Lindsay, says, "The terrorism which is in England exerted on asylum authorities by the bugbear of public opinion, the anathemas of the fourth estate, and the censorship of the Board of Lunacy, is a very real one." Even among themselves, he says, they speak with "bated breath." One writing to him says, "I quite agree with your remarks about the *terrorism* that the Lunacy Commissioners exercise." Another says, that, "one can scarcely be too much of a *coward*, if he would avoid imputations" as ridiculous as groundless. These passages occur in connection with an article on rib-fracture among the insane, in the *Edin. Med. Journ.* for Nov. 1870. False public opinion, as formed and expressed by the Boards, Dr. Lindsay holds largely responsible for these distressing cases, resulting from personal struggles which would not have occurred had mechanical restraint been permitted.

In the paper before noted, Dr. Kellogg refers, in terms of regret and sympathy, to the humiliating position in which asylum superintendents are placed, by the forced abandonment of their own judgments, at the dictation of Commissioners, on whose breath depends position, and professional status before the public. "Medical authority is not supreme here," was the significant reply of a subordinate officer, when asked if certain cases could not be better managed by simple apparatus.

We had designed saying something about the views here expressed as to the practicability and expediency of caring for the American insane, at charges, both for buildings and maintenance, approaching those incurred for the pauper insane of Great Britain. Space remains, however, for a few words only. That in our country, with our people, fit and proper curative hospitals can be located, constructed and equipped, for much less than the average cost of our State hospitals, we have seen no reason to believe. That proper care, cloth-

ing, and diet, to secure comfort and promote cure, can here be provided at the English rate, or say $3 per week, we doubt. By massing together very large numbers of incurable paupers, both lines of expenses can undoubtedly be much reduced, at least apparently, and at the outset. Whether such separation and aggregation, with its cheaper maintenance, be, on the whole, desirable, or even pecuniarily economical, may be uncertain. We hope the day may be far distant in which Americans shall begrudge any expense necessary to place their insane in conditions fitted to promote cure, or render prolonged life decent and comfortable.

If we have seemed to dwell at disproportionate length upon the "non-restraint" matter, it is because the supposed superiority of this treatment, and the alleged unanimity of British physicians in its favour, has been asserted with somewhat offensive urgency of late, not only by native mal-contents, but by a distinguished English visitor. We trust enough has been said to exhibit the true character and standing of the "non-restraint" craze, and to show that, in this matter at least, we need not disparage our own institutions.

B. L. R.

Note.—Since finishing the above notice, we have received the Report of the Borough Asylum for the Insane, at Newcastle on Tyne, for 1875. Superintendent R. H. B. Wickham, F.R.C.S. Ed., apologizes for the number of days of "seclusion" recorded. This treatment was especially used upon three patients of violent and murderous propensities. "How the cause of humanity, science, or anything else good is promoted by allowing such persons to be at large, even in asylum wards," he is quite at a loss to see. Something is due, he adds, to the feelings of quiet and orderly patients, who, with the officers, dread and fear these desperate men. Violent assaults, he thinks, should be prevented, and not merely apologized for. Yet, he says, that "in deference to" the "very strongly expressed wishes" of the Commissioners, he has since their visit "almost entirely relinquished the use of seclusion." A pair of wristlets upon each of these men would have probably enabled them, under proper watching, to enjoy the range of ward and yard among their fellows, and have saved the latter from assaults. Not daring to use these simple appliances, the superintendent did his duty to the innocent and harmless patients by shutting up the violent. And the Lunacy Board, which tolerates no restraint, forced him to turn them loose again! No thanks to the Board, but luckily for the Dr. and his patients, two of these dangerous men have been removed, and one has passed into a quieter stage of his disease. No better exhibition of the evils of non-restraint, the subservient position of superintendents, and the unintelligent supremacy of the Commissioners, can be desired. And this is the state of things held up for American admiration and imitation!

ART. XXXIV.—*A Sketch of the Life and Writings of Louyse Bourgeois, Midwife to Marie de Medici, the Queen of Henry IV., of France.* The Annual Address of the retiring President before the Philadelphia County Medical Society. By WILLIAM GOODELL, A.M., M.D. Delivered June 5, 1876. Published by order of the Society. 8vo. pp. 52.

ALTHOUGH a rather singular subject for a retiring presidential address before a body not specially devoted to obstetrical study, this review of the life of one of the last of the race of midwives who in ignorance and superstition held for many centuries an entire monopoly of their art, and literally dwelt in kings' houses when the births of princes and princesses were to be attended to, is of much historical interest, as the story is interwoven with many of the doings of the French Court, especially in relation to the births of the children of the quondam Princess of Tuscany, now become the haughty and jealous queen of the dissolute Henry of Navarre.

Although from the earliest ages of the world, down to the 17th century, women held an almost absolute control of obstetric practice in all countries, it was not until 1608, in France, and 1671, in England, under Madame Bourgeois and Mrs. Jane Sharp, that any one of them ventured to publish their acquired knowledge for the benefit of humanity. It is also singular that the century of their literary labours was also the commencement of their downfall, under the advances made through the inventive genius of Peter Chamberlen, and the mental labours of Harvey, Willughby, and others, who, substituting superior skill and judgment for ignorance and necromancy, turned the tide against them in spite of sexual antipathy, prejudice, and bitter invective, by exhibiting their more successful handling and treatment of cases, as compared with the said quondam monopolists.

We cannot, with Dr. Goodell, see much to admire in Madame Bourgeois, except it be her coolness of bearing; which can only be attributed to an exalted opinion of her own abilities, based upon a lamentable ignorance of the imperfection of her knowledge. She did, it is true, possess a certain degree of skill, but the medical treatment of her cases was about as senseless as that of the Chinese at the present day. We are glad that the "Royal Midwife" no longer parades her ignorant quackery in the palaces of kings. As an interesting historical paper in the peculiar style of its author, the searcher after the past in obstetrical science, will find in it much that is entertaining. R. P. H.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Vaso-motor Centres in the Cord.*—N. Bothling agrees with Goltz that there are vaso-motor centres in the spinal cord, which may act on the vessels after cutting the cord, and which may be paralyzed by narcotics such as chloral hydrate. His results differ, however, from those of Goltz in respect to the vaso-motor fibres in the sciatic. Irritation of this nerve, the present author always found to contract the vessels, lowering the temperature, whereas Goltz obtained the opposite effect. The author suggests that there may be inhibitory fibres in the sciatic, which cause dilatation of the vessels, and that Goltz may have irritated them, while his mode of experimentation did not. Stricker adds in a note that he has, since the above paper was written, actually proved the existence of such depressor fibres, which he will describe in a future paper.—*Glasgow Medical Journal*, July, from *Stricker's Jahrbücher*, Pts. i. and ii. 1876.

2. *The Relations of the Serous Channels to the Bloodvessels.*—Dr. P. Foa, Montava, has published the result of experiments on the frog, and is of interest as confirming some former views, and as rendering still more certain the intimate relation of the serous spaces with the bloodvessels on the one hand and the lymphatics on the other. In the first series of experiments the observations of Arnold are confirmed, in respect that after the vessels have been altered by a venous congestion, an injection-material thrown into the arteries penetrates from these vessels to the serous channels. But this author goes further, he finds that without any previous disturbance of the circulation he can inject the serous channels from the bloodvessels, if before the colouring matter a solution of phosphate of soda has been thrown into the vessels. With the living animal, however, his results are even more convincing, for he was able to inject the serous spaces without any previous washing out of the vessels with phosphate of soda. Under ordinary circumstances considerable pressure was needed to effect this; but if curare had been previously administered, it was much easier. The probability is that the injection in the former case irritates the vessels, and, causing them to contract, opposes a great obstacle to further injection. When curare is given, the vessels are relaxed. The author has some further observations on the path by which the colouring matter passes from the vessels to the serous spaces. After injecting vermilion or China ink, he washed out the vessels, and then found that the pigment marked out the borders of the endothelial cells, just like nitrate of silver; that in fact the solid granules of pigment were stuck in the cement between these cells. This seems to show that the pigment passed out through the cement

substance, which must be a semi-fluid substance with interstices in it. Some further experiments seemed to show that in the neighbourhood of inflamed parts the vessel wall is more permeable than normal. The author's injections were more successful in filling the serous spaces in such situations.—*Glasgow Medical Journal*, July, from *Virchow's Archiv*, Pt. iii. Dec. 1875.

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

3. *Salicine as an Antipyretic.*—Prof. SENATOR states that salicine administered in doses of two and a half to six grammes lowers the temperature in some febrile diseases just as certainly as salicylic acid does. He has used it in typhoid fever, phthisis, and parametritis. Dr. Maclagan has shown that salicine has the same specific action in acute rheumatism as salicylic acid, into which, according to the researches of Ranke, Lehmann, and others, it is converted in the blood. Salicine is less unpleasant to take than salicylic acid. It can be given in powder mixed with sugar, or, better, in the form of pills. Its price is somewhat less than that of the acid and its salts, and no doubt, if the demand for it increases, it will be still cheaper, for it can be procured in abundance from poplars and willows. Salicylate of ammonia is recommended by Dr. Martenson, of St. Petersburg, as a substitute for salicylic acid. It is easily prepared by saturating an aqueous emulsion of the latter with ammonia or carbonate of ammonia. It is easily soluble in water and alcohol, has a sweet taste, and contains nearly 89 per cent. of acid.—*Med. Times and Gaz.*, July 29, from *Centralblatt Med. Wiss.*, No. 14, 1876.

4. *Physiological Action of Condurango.*—Dr. T. LAUDER BRUNTON has published in our excellent cotemporary, the *Journal of Anatomy and Physiology* (April, 1876), a number of experiments instituted by him to determine the physiological action of condurango. "The general result of all these experiments is that condurango is physiologically inert."

5. *Action of Salicylic Acid in Diphtheria.*—L. LETZERICH states that diphtheritic organisms (fungi obtained from the urine of children suffering severely from diphtheria, and consisting of bacteria, masses of protoplasm and micrococci) placed in a closed vessel with solution of salicylic acid containing 0.35 of the acid, one part of spirit and 59 of water, when examined after an interval of five months, were all found lying dead at the bottom of the vessel. A few drops of weak solution of salicylic acid (of about one-third the above strength) brought into contact with diphtheritic organisms arrested the movements of the bacteria present gradually; stronger solutions arrested them suddenly. The plasma corpuscles lost their brilliancy and acquired a double outline, as if they were surrounded by an extremely delicate membrane; the substance of the protoplasm appeared to contain bubbles of air. Letzerich treated seven cases of diphtheritis with gargles of salicylic acid, and all of them successfully. In two other instances powdering the surface with a little dry salicylic acid proved very effective. From these and other observations and experiments he believes that salicylic acid is a powerful anti-diphtheritic agent. —*Practitioner*, Aug., from *Centralblatt für die Chirurgie*, No. 3, 1876.

6. *Bromohydric Acid.*—Dr. J. MILNER FOTHERGILL states that this acid can be obtained by dissolving ℥x, ℥vj. gr. xxviij of bromide of potassium in four pints of water, then add ℥xiij, ℥j, gr. xxxvij of tartaric acid. The bitartrate of potash is precipitated, and the hydrobromic acid remains in a clear bright, almost colourless fluid, possessing an acid taste and the ordinary acid properties, as well as the peculiar properties of bromide of potassium, as compared with any other salt of potash.

After a year's experience with the drug Dr. F. says "it certainly does prevent the occurrence of headache, after each dose of quinine, in those who before had to desist from taking quinine for that reason. It is, perhaps, not invariably successful, but its power is very marked. It also prevents the fulness felt in the head by some persons, especially those labouring under cerebral anæmia, after doses of iron. It is also useful in nervous conditions, and, with quinine, is excellent in those cases where there is much nervous exhaustion from excessive indulgence in tea or in alcohol; this being tried in a case of nervous excitability and sleeplessness, where there had been much resort to chloral-hydrate.

In forms of excited action of the heart, connected with general nervous excitability or nervous exhaustion, hydrobromic acid is most useful. Given with quinine (of which it is a capital solvent) and digitalis, it gives better results than the bromide of potassium and digitalis; this is a favourite combination with me at both my hospitals, and is agreeable as well as effective. In all hysterical conditions connected with ovarian excitement, it seems to have all the properties of the bromide of potassium. It is equally useful in the vomiting of pregnancy, and seems to exercise quite as powerful an influence over acts of reflex origin as does the bromide. It is especially adapted for the relief of menorrhagia associated with sexual excitement, and is even more effective here than the bromides themselves. It is also of use in whooping-cough, and combines conveniently with quinine, forming an effective measure in this troublesome affection. With spirit of chloroform and syrup of squills, it forms a most agreeable and palatable cough mixture of no mean potency. It is also of use in case of cough of reflex origin. Where there is gastric irritability, it is the most useful of all acids, possessing the usual properties of acids generally and of the bromine as well.

The dose of the acid, prepared as above, is one drachm as a full dose. Half a drachm is the dose I ordinarily employ. Bromohydric acid has the further advantage of not producing the troublesome eruption so often the result of doses of the bromide of potassium, at least so far as my experience has yet extended. There are many qualities about this acid to render it a useful member in our therapeutical *armamentarium*.—*Brit. Med. Journ.*, July 8, 1876.

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7. *Antagonism between Morphia and Atropia.*—Dr. Corona describes some experiments which he has made on dogs, rabbits, and frogs, with regard to the antagonistic action of morphia and atropia. The following are the conclusions at which he has arrived:—

a. Atropia quickens respiration in an extraordinary manner; morphia, on the other hand, retards it greatly, and modifies it, the inspirations becoming large and deep, and the expirations slower.

b. Morphia produces sleep and deep coma; atropine, on the contrary, produces severe convulsions, but never sleep, in dogs and rabbits.

c. Morphia quickens the movements of the heart; atropia renders them slow.

d. While morphia accelerates the heart's action, the temperature (generally taken in the rectum) falls; atropia, on the other hand, diminishes the heart's action, while the temperature remains stationary or is slightly increased.

e. In the action of atropia, the dilatation of the pupils is the most marked symptom, as sleep is in the case of morphia; with morphia, on the other hand, the pupil is sometimes dilated, sometimes stationary, sometimes contracted. Dr. Corona finds, 1. that dilatation of the pupil occurs in animals principally when the dose of atropine introduced into the blood is relatively mild; 2. that, when the dose of atropine injected into the circulation is large, dilatation does not occur, because both the circular and radiating fibres of the iris are paralyzed; 3. that dilatation of the pupil is produced by the injection into the eye of a solution containing a very small fraction of a milligramme of atropia; 4. that the dilatation of the pupil constantly occurs, even when a large quantity of atropia is injected gradually, the other symptoms of poisoning being sudden, in consequence of the rapid elimination of a large portion of the poison.

f. Morphia never produces vaso-motor paralysis; atropia always does, as is clearly shown by observing the ears of rabbits poisoned with it. As regards

this: 1. The congested vessels of the ear constantly return to the normal state under the influence of galvanization of the cervical sympathetic, in rabbits previously poisoned with atropia, and in which the vaso-motor paralysis is at the maximum. 2. During the galvanization of the sympathetic, the constriction of the vessels is followed by a diminution of temperature, corresponding to the increase attending the vaso-motor paralysis of the ear. 3. In rabbits, 20 centigrammes (0.3 grain) of neutral sulphate of atropia are required on an average to produce vaso-motor paralysis, and the injection must be made at one time; otherwise as much as 70 centigrammes (little more than a grain) may be used without producing this phenomenon, if it be injected in doses of 10 centigrammes at intervals of five minutes.

g. Morphia, while it constantly produces sleep, leaves reflex action intact, and sometimes exalts it; atropia depresses reflex action, and always produces paralysis of the posterior part of the body in animals.

As regards necroscopic results, the following conditions were always observed.

h. The lungs, liver, and spleen, were normal in both cases. The heart and large vessels were always full of blood; but this was coagulated in poisoning by morphia, fluid and blackish in poisoning by atropia. The meninges in both cases were always congested, while the brain-substance was constantly found to be anæmic. The medulla oblongata and the tubercula quadrigemina were never found hyperæmic, while the meninges covering them were so.

i. As regards the toxic dose, there was very great variation both in regard to the age and race of the animal. In rabbits, morphia was sometimes fatal in doses of 20 centigrammes (0.3 grain); whilst sometimes as much as 50 centigrammes (0.75 grain) was borne. Sleep and slowness of respiration were, however, constant results even of very small doses. In dogs, the toxic dose was much less. Atropia was tolerated in very large doses; in rabbits as much as one gramme (15 grains). It was, in many cases, fatal in doses of 50 centigrammes; never in less, except in young and very small animals. Large doses of atropia were tolerated on the first two days, but the animal did not survive the third. Even with small doses, the remarkable quickening of the respiration, the dilatation of the pupils, and the vaso-motor paralysis, were observed.

Experiments made on the pneumogastric nerves during the poisoning, whether by morphia or by atropia, showed that the antagonistic respiratory changes always proceeded from the centres of respiration.

k. Finally, with regard to the result of experiments on the alleged antagonism of atropia and morphia, Dr. Corona makes the following remarks: 1. Morphia was always capable, even in very small doses, of removing the symptoms produced by atropia, and of producing sleep. 2. During morphia sleep, very large doses of atropia did not in the least alter the symptoms due to morphia, nor was the sleep ever found to cease. 3. When atropia was injected in small doses at intervals of ten minutes, although the total quantity was large, its action was more rapidly extinguished by small doses of morphia, than when atropia was injected in a dose of not less than 20 centigrammes. 4. The injection of the two poisons into the veins showed that a much smaller dose was sufficient to produce rapid and grave poisoning; but even then the morphia produced its action instantaneously, and its symptoms always superseded those of atropia. 5. The injection into the veins of large doses of atropia and very small doses of morphia was always followed by sleep, and the manifestation of the symptoms due to atropia was tardy. 6. In all cases, after the disappearance of the symptoms due to morphia, those due to atropia appeared, in intensity proportionate to the largeness of the dose administered for the purpose of counteracting the symptoms due to morphia.

From these results, Dr. Corona concludes that a partial physiological antagonism may be recognized, but that the idea of a mutual therapeutic antagonism cannot be accepted.

He recommends in poisoning by atropia the injection of morphia and its salts, both into the veins and by the hypodermic method, but altogether disapproves of the idea of combating morphia poisoning with atropia, both because very large doses of the latter are incapable of removing the symptoms produced

by morphia, and because, even if the latter are temporarily relieved, the still more deadly symptoms due to atropia supervene.—*Lond. Med. Rec.*, Aug. 1876, from *Giornale di Medicina Militaire*, April and May, 1876.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

8. *Treatment of Angina Pectoris.*—According to Prof. Sée, this affection is not a neurosis but an ischæmia combined with pain. The treatment should therefore be twofold. As the pain, which by its violence stops the breathing, can kill the patient in a few minutes, it is to it that we must first address ourselves when called during an attack; and we must not trust to ordinary means, which would probably act too slowly: we must immediately administer a hypodermic injection of one to two centigrammes (0.15 to 0.3 grain) of morphia. This injection, moreover, should be repeated one to three times a day, and continued at least twice in the twenty-four hours, for some weeks, until the attack has completely disappeared. Without this we shall see it reappear, and shall lose all the benefit of the remedy.

With respect to the ischæmia which we are about to mention. The morphia acts not only by suppressing the pain; it assists the circulation also, and thus directly addresses itself to the ischæmia, which, stopping the heart from receiving sufficient blood, it causes to lessen. Together with these morphia injections, we ought to give chloral enemata. By the mouth this remedy will not be borne in these cases, and it seems besides to be more easily absorbed by the rectum. This is the formula of M. Sée: ℞ chloral 2 to 3 grammes; mucilage, q. s.; water, 150 grammes. Make an enema. Chloroform should be completely banished from the treatment of angina pectoris, because it favors arrest of the heart. Nitrite of amyl has no action as a sedative, but it may perhaps be useful, because it dilates the vessels. Belladonna produces no effect; and as for antispasmodics, they are absurd in a case so serious and urgent. Acetate of ammonia has a certain value as an excitant of the circulation, and because it acts at the same time on the respiration; but it is not so valuable as the morphia. External measures, as cupping, heat, frictions, etc., have no value; nevertheless, we are sometimes obliged to use them in deference to prejudice. To prevent a return of the attack, we must have recourse to bromide of potassium or digitalis. During the attack the use of bromide would be absurd, because it contracts the vessels instead of dilating them; besides, its action would be too slow; but in the interval it serves, like digitalis, as a regulator of the circulation and the respiration. Arsenic, much vaunted, does no good. Hydrotherapy is highly dangerous, and its employment can only be explained on the idea that we had a neurosis to deal with. With this method of treatment, either a return of the attack or cerebral congestion is to be feared.—*Lond. Med. Record*, July 15, 1876.

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9. *Sunstroke treated by Quinia; Recovery.*—A case of this is reported by Dr. Drake (*Canada Med. and Surg. Journ.*, Sept. 1876). The patient, a man æt. about 45, was found by the police, on the afternoon of July 13th, lying on his back insensible, in an open place near the wharves, quite unsheltered from the intense rays of the sun, and brought to the Montreal General Hospital at half-past 5 o'clock. "On admission he was insensible, skin hot and dry, face dusky, pupils contracted, conjunctiva injected, tongue dry and parched, respiration shallow, pulse feeble and thin, almost imperceptible and quite impossible to count, secretion completely arrested; temperature 107.8°.

Seeing the necessity for prompt action, I at once applied an ice-bag to the head, and, on account of the excessively high temperature, gave him 30 grains of quinine in three doses at intervals of half an hour. Two hours after the first dose was administered, the skin became moist and was soon covered with profuse

perspiration; four hours after the first dose, urine and liquid feces were passed freely in bed, and the urine continued to pass away in large quantity during the night. Six hours after the administration of the quinine the temperature had fallen to 103°, pulse 112, and fourteen hours after to 100.4°, pulse 90. Dr. Drake saw him the following day, and ordered quin., gr. v, to be given every four hours; four such doses were given, when he was allowed to get up. All bad symptoms disappeared, and he was discharged from hospital on the morning of July 17, having been under treatment for three days and a half, and having taken altogether fifty grains of quinine in divided doses.

The quinine was administered by the mouth in the form of 10 grain cachets; if it had been impossible to give the quinine in this manner, it would have been administered hypodermically.

Accompanying this report is a chart showing the rapid fall of the temperature under the quinia treatment.

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10. *Tapping the Chest of a Child three years of Age.*—Dr. GRIFFITH records (*Lancet*, August 19) the case of a boy three years of age, in which he removed from the left pleura, by a Dieulafoy's aspirator, 121 ounces of pus in five successive tappings, with satisfactory results.

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11. *The Cold Bath in Cholera Infantum.*—Dr. VOCKE, of Berlin, read a paper on this subject before the German Association at Gratz, since published in the *Oesterr. Jahrbuch f. Pädiatrik*, 1875.

Children, he says, who are otherwise healthy, become the subjects of severe summer diarrhœa, that has hitherto resisted treatment. The means of treatment may indeed be educed from a consideration of the effects of the high temperature in producing it; for just as young plants faded by the prevalence of heat may be revived by watering them, so may the infant by repeated cold washing and bathing be enabled to resist the effects of disease so caused. In the summer of last year, Dr. Vocke submitted almost all his cases to the cold bath, with most remarkable success. Some of these—healthy children, the subjects of diarrhœa or cholera, having the cholera aspect, and presenting not the slightest hope of recovery—seemed the next day as if born anew. Sometimes the temperature was raised to 40° C. (104° F.), the pulse being scarcely perceptible and the child excessively restless. Any sleep procured by opiates was unrefreshing, and the child got worse and worse. On three or four cold baths being given, good sleep was obtained after each, the child being more lively, changing its fixed dull stare for the seeking glance, taking food, and having fewer and better stools. It is not meant to be asserted that these good effects were exclusively due to the baths, for other remedies were employed conjointly; and when the seat of the disease seemed located low down the rectum, small enemata of nitrate of silver with a few drops of tincture of nux vomica were ordered—a means of well-known efficacy in sporadic diarrhœa at other periods of life. The cold baths operate by relieving the state of exhaustion into which the child has fallen in consequence of the heat, and restore it to a viable condition, similar to that in which grown-up persons and children in winter find themselves if they become accidentally the subjects of diarrhœa—pharmaceutical substances now again becoming of utility as in winter.

In this affection the infant should not be covered up as in winter, but only lightly so, the cradle being placed in an airy part of the dwelling, though out of a draught; and the windows thrown widely open, not only for the purpose of ventilation and cooling, but also to admit a purer air than is found in the sick-chamber. Caution must also be observed with respect to the baths themselves, on account of the fear entertained by most mothers of cold baths—which sometimes have acted mischievously. In some cases, therefore, it will be well to commence by making cold applications first to the head, and then to the belly—a measure which has often prolonged the child's life. The mother, witnessing the effect of these, will then consent to put the child into a bath of 26° (78° Fahr.), and next day of 24° (75° Fahr.); and a temperature lower than 22° (71° Fahr.) is of no advantage, and may prove dangerous. The bath should be repeated three times in twenty-four hours. Dr. Vocke has not kept notes

of the cases he has treated so satisfactorily by this means, but they cannot be less than a hundred, and the cures were durable.—*Med. Times and Gaz.*, July 22, 1876.

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12. *Treatment of Boils and Carbuncles.*—Dr. Peter Eade, in an article in the *Brit. Med. Journ.* for July 1, 1876, maintains the following doctrines in regard to these affections:—

1. That boils and carbuncles are not mere inflammations and sloughings of cellular tissue, but specific diseases.

2. That they are parasitic, and, as such, endowed with a definite life and history.

3. That, in their early stages, they may be infallibly destroyed and aborted by destruction of their central stem or root; and that even after this stage has passed, they may generally be destroyed, and in all cases, at the very least, greatly modified, by the free application of carbolic acid.

4. That, to produce this result, the acid must be freely introduced into the central portion of the disease, and also into any other part where an opening exists or is formed artificially.

The essentials for the proper action of the carbolic acid, Dr. E. conceives to be:—

1. The acid must be applied in *strong* solution (four or five parts of acid to one of glycerine is the strength I employ).

2. It must be brought into contact with the diseased tissue, for it appears to exert no influence on or through the unbroken skin. To this end, if sufficient opening do not exist when the case is first seen, a proper one must be fearlessly made in the very centre of the disease by some appropriate caustic, and, perhaps, the acid nitrate of mercury effects this better and with less discomfort than any other.

3. The acid solution must be occasionally reapplied to, and into, the hole thus formed, or those already existing, and I have found it a good plan to keep a piece of lint wet with a weaker solution constantly over the sore.

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13. *Report of the Special Committee appointed by the Medical Society of Victoria to investigate the Subject of "Intra-venous Injection of Ammonia in Cases of Snake Poisoning, and to take into consideration the Report of the Indian Commission."*—The number of the *Australian Medical Journal* for April last contains the report of this committee, which by no means sustains the claims of Dr. Halford as to the efficacy of the ammonia treatment, and confirms the report of the Indian Commission. (See number of this Journal for July, 1875, pp. 151–4.)

The committee states that their attention being particularly directed to the intra-venous injection of ammonia, this remedy was employed in thirty-one cases, in five of which it was injected by Professor Halford. It cannot be said that the ammonia treatment was in any way beneficial. A few other remedies tried by the committee also failed. The committee regrets that, owing to the great length of time required in the carrying out of these experiments, it has not been able to complete all that it desired to perform, but it hopes to be able to report further on a future occasion. On account of the failure in its hands of the ammonia treatment, the committee invited Professor Halford to personally inject the remedy. He attended on two occasions and experimented on five dogs, all of which died.

The details of 81 experiments on dogs are given.

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14. *Bicarbonate of Soda in Suppression of Urine.*—Dr. W. L. Lane states (*Brit. Med. Journ.*, July 15th) that he has found nothing so useful in suppression of urine from renal disease as the bicarbonate of soda. He has used it in a great many cases with success, and quotes the following remark of Dr. Dickinson in his lectures on albuminuria as confirmatory of his statement:—

"But it is worth mention," says Dr. D., "in relation to a rapidly fatal form of nephritis, in which the tubes become widely sealed up as if with molten glass by a pseudo-croupous exudation of fibrin, while the urine is loaded, not

only microscopically but as a bulky precipitate, with large fibrinous cylinders, that all plugging from this cause can be prevented by alkalies."

15. *On Ingravescent Apoplexy: a Contribution to the Localization of Cerebral Lesions.*—Dr. BROADBENT, in a communication to the Royal Medical and Chirurgical Society (May 23), remarked that Sir Thomas Watson, following Abercrombie, described three forms of apopletic attack: the first sudden, with loss of consciousness and stertorous breathing; the second beginning with sudden pain in the head, faintness, and vomiting, followed by gradually increasing coma; the third characterized by sudden hemiplegia, without loss of consciousness. To the second of these modes of attack the term "ingravescent" had been applied. Its characteristic features were absence of loss of consciousness at the outset, gradual accession of symptoms, and speedily fatal termination; and the cause was invariably found to be a large extravasation of blood. The object of the communication was to show that not only is the hemorrhage large in these cases, but that its situation is, within certain limits, constant, and also that an anatomical explanation can be given of the phenomena of the attack. The seat of the hemorrhage was described as being the outer side of the extra-ventricular corpus striatum (lenticular nucleus of foreign writers), between this ganglion and the "external capsule;" and the explanation offered was as follows: The large amount of blood extravasated arises from the large size of the vessels here found, and from the slight resistance opposed to the effusion; and the absence of loss of consciousness is due to the fact that there is little laceration of fibres or compression of the brain. The situation and relations of the clot are best seen by opening out the fissure of Sylvius, when the convolutions of the island of Reil will be found to be obliterated and spread out over the effused blood. Afterwards, by the usual sections, the further course of the extravasation into the ventricle or into the substance of the hemisphere can be traced. The following cases were related: *Case* 1. A man, aged fifty, was suddenly seized with giddiness and slight mental confusion; left hemiplegia was early noticed. but there was no loss of consciousness. He was brought immediately to St. Mary's Hospital; and, though a little excited, he gave an accurate account of the circumstances attending the attack. There was left hemiplegia, with relaxation of the paralyzed limbs; no distortion of the face, but extreme conjugate deviation to the right of the head and eyes; marked hemianæsthesia affecting the face and body as well as the limbs; slight reflex action on tickling the left sole. The pulse was 108, long and firm, but weak. A tendency to sleep became manifest; and the nature of the case being recognized, an attempt was made to bleed. Three veins were opened in the arms, but only a trifling amount of blood could be obtained; the jugulars could not be made to fill sufficiently, and vomiting interrupted further proceedings. The patient continued to sleep, but could be roused till about eight hours after the attack, when stertor suddenly set in; he was then found to be quite unconscious, and in about twenty minutes he died. During the final stertor, the lateral deviation of the eyes ceased; the heart was felt to beat for seven minutes and a half after cessation of respiration. On post-mortem examination, hemorrhage of large amount was found to have taken place between the corpus striatum and external capsule, flattening out and distending the convolutions of the island of Reil, forming a cavity along the outer side of the corpus striatum and thalamus two and a half or three inches long, and penetrating the lateral ventricle by a fissure extending almost the entire length of its outer angle. All the ventricles were filled with blood. There were hemorrhages into the lungs, spleen, and liver. The kidneys were contracted and granular. *Case* 2. A woman, aged forty-five, had slight paralysis on January 8, 1871, which soon passed off. On the 11th she suddenly lost power in the left limbs, and vomited. She slept almost continuously for two or three days, waking at intervals, and then appeared to be quite sensible. The urine and feces were passed involuntarily, and bedsores formed. After about three weeks the patient was brought to the hospital, and was then found to have left hemiplegia, with some distortion of face and hemianæsthesia. She died three days after admission. On post-mortem examination, hemorrhage was found to

have occurred between the corpus striatum and the external capsule, bulging out the island of Reil, and dissecting off from the hemisphere both corpus striatum and thalamus, and displacing them inwards. The blood penetrated the corpus striatum about its middle for a short distance; it did not reach the ventricles. Stenosis of the mitral orifice, embolisms in the spleen, and contracted granular kidney, were also found. *Case* 3. A cabman, aged sixty, who nine months previously had had a "fit," was noticed by a policeman, about 1 A. M., to be sitting on the box, apparently drunk. He was ordered to get down; answered, "All right," and obeyed; got into his cab, and was driven to a police-station. Here he vomited matters smelling of spirit, and was considered to be drunk by the medical officer who was called in, till left hemiplegia became obvious. When first seen at the hospital, some hours later, he was unconscious, and had less hemiplegia, with rigidity and hemianæsthesia. Reflex movement could be provoked in the paralyzed limb. Apparently there was deviation of the eyes. He died on the day after admission. Hemorrhage had taken place between the corpus striatum and the external capsule, dissecting off the ganglion and the thalamus from the hemisphere, and entering the ventricle by a fissure in its outer angle, at about the middle of its length. The body of the intra-ventricular corpus striatum was thus cut off from its tail and from the thalamus. The clot in the ventricle was not very large, and blood had not entered the other ventricle; that in the hemisphere extending forwards nearly to the apex of the frontal lobe. The kidneys were contracted and granular, and the heart hypertrophied. *Case* 4. A woman, aged fifty-six, previously healthy, began to drop parcels which she was carrying, and felt giddy. She walked some distance, sat down, and became unconscious. When brought to the hospital an hour later, she was apparently unconscious, had left hemiplegia, with rigidity, and continual movements of right limbs. She could be roused, and then answered intelligently. She died two days later. Hemorrhage had occurred in the situation described in previous cases, taking a direction forwards into the frontal lobe, dissecting off the corpus striatum, and bursting into the ventricle. *Case* 5. A coachman was grooming his horse on the evening of December 10, 1875, when he felt a numbness in the right arm; he did not fall, or lose consciousness. Hemiplegia came on gradually in the course of an hour; he vomited, and afterwards went off into a heavy sleep. When brought to the hospital next day, his mind was confused, his speech rapid and indistinct and exactly like that of a drunken man, and he had right hemiplegia with lateral deviation of the eyes (not of the head), and very marked hemianæsthesia. He improved a little, but on the 15th the temperature rose rapidly, being always a degree higher on the paralyzed side; and he died on this day. The hemorrhage in this case was between the external capsule and the ganglia, but further back than in any of the cases previously reported, and the blood had penetrated into the ventricle between the thalamus and the intra-ventricular corpus striatum, and had also dissected up the posterior end of the thalamus from the segmentum, and damaged the superior corpus quadrigeminum. Dr. Broadbent remarked that the occurrence of extensive extravasation of blood in the situation described has been noted by Charcot, Bouchard, Bourneville, Prévost, Duret, and others, and the cases related connected it with the ingravescent mode of attack. Duret had shown what the author had observed independently, that the vessels entering the brain at the anterior perforated space and in the fissure of Sylvius for the supply of the corpus striatum, run up between the gray substance of the ganglion and the external capsule; some of them are of large size, and their mode of termination predisposes to rupture. This is the great cause of the liability to large hemorrhage. The inner layer of the external capsule consists of fibres arising in cell-processes of the corpus striatum, but it is detached with great facility, offering therefore little resistance to extravasation of blood. The Sylvian fissure again affords room for the expansion of the island of Reil, which lies immediately upon the capsule—a fact which diminishes the pressure, and not only permits the hemorrhage, but prevents compression of brain-substance by the effused blood, thus obviating early coma, and explaining the ingravescent mode of attack. In its further course the extravasated blood must tear fibres, and it is remarkable

that it does not burst through into the fissure of Sylvius, from which it is separated only by a thin plane of fibres, or enter the temporo-sphenoidal lobe. The fibres torn are those of the corona radiata as they enter from the central ganglia to pass to the hemisphere; and it is probable that the intersection of the fibres of the external capsule with these, and the passage of minute arteries and larger and more numerous veins, afford minute openings by which the blood makes its way. Ultimately the blood may penetrate the ventricles or split up convolutions.—*Med. Times and Gaz.*, July 15, 1876.

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16. *Spinal Apoplexy.*—In the January No. of Virchow's *Archiv* (Bd. lxv.), Dr. GOLTDAMMER describes fully a case of paraplegia, which he regards as undoubtedly the result of spontaneous hemorrhage into the spinal cord, independent of any previous inflammatory softening. On April 21, 1874, a girl, aged fifteen, apparently in perfect health, was suddenly seized with violent pain in the back between the scapulæ, extending rapidly to the arms, the lower part of the chest, and the epigastrium. The right leg became at once powerless, and in another half hour the left was in the same condition. Two hours after the commencement of the attack she had complete paraplegia, complete anæsthesia up to the level of the nipples, persistence of reflex movements in the lower extremities, and paralysis of the bladder; in the upper extremities, severe pains, but free movement and normal sensation. The functions of the brain were perfect. The case continued to present all the characters of paraplegia from a localized lesion of the spinal cord. The electric irritability of the muscles remained normal; the urine was retained; and bedsores appeared. After two months, the reflex irritability became excessive; somewhat later spontaneous twitchings of the paralyzed muscles took place; and towards the end of August the legs were persistently contracted, at first in the extended, later in the flexed position. Increasing bedsores led to a fatal result, twelve months from the beginning of the illness. On opening the spinal canal, the dura mater was found normal; the spinal cord was contracted to half its width at a point corresponding to the second dorsal nerves, and here the pia matter was a little thickened. This narrow portion had a vertical extent of about one-sixth of an inch. On section there was no trace of gray matter, but the greater part was of rather hard consistence, and in colour rusty brown with whitish-yellow streaks. The white columns on the left side were softer and tinged gray. A rusty streak was traceable in the situation of the right posterior cornu upwards to the cervical swelling, and downwards as far as the fifth dorsal nerves. On microscopical examination, the dense rust-coloured portion was found to consist of a firm network of connective tissue fibres, with embedded fat globules, large masses of hæmatoidin crystals, and collections of brown granular pigment. Nerve-elements were entirely wanting, and the vessels showed fatty and granular degeneration. The grayish columns on the left side, and the whole cord for a few millimetres above and below the rusty cicatricial tissue, were in a condition of softening with the usual granule-corpuscles replacing the nerve-fibres and ganglion-cells. Secondary degeneration could be traced downwards in the lateral columns to the lumbar region, and upwards in the posterior columns as far as the calamus scriptorius.—*Lond. Med. Rec.*, July 15, 1876.

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17. *Pathological Alterations in the Nervous System in Rabies.*—Dr. KONSNIKOFF, of St. Petersburg, describes the following microscopical changes found by him in the nervous system of ten dogs which had suffered from hydrophobia. The principal alterations were met with in the sympathetic and spinal ganglia, and were of two kinds: 1. Extreme dilatation of the bloodvessels, which were infarcted with red blood-corpuscles. Some of the latter had escaped from the vessels, and lay outside, scattered among a number of white corpuscles in the perivascular spaces. In some parts of the vascular walls, hyaloid masses of various shapes were visible, which sometimes projected into the lumen of the vessels so as to block them completely. These masses appeared to be produced by a metamorphosis of the white and red blood-corpuscles. 2. Around the nerve-cells, collections of round indifferent cell-elements were seen, some of

which had penetrated into the protoplasm of the nerve-cells, so as to alter the shape of the latter and give them a jagged outline. Sometimes the nucleus was forced outwards to the edge of the nerve-cell and sometimes the new cell-elements appeared to occupy the place of nerve-cells, which were no longer visible. Dr. Kobsnikoff remarks that the pathological changes which occur in rabies closely resemble those described by Dr. Popoff in typhoid fever, and after mechanical injuries to the nervous system.—*Med. Times and Gaz.*, July 29, from *Centralblatt*, Nov. 29, 1875.

18. *Hereditary Transmission of Syphilis.*—Dr. M. Kassowitz, of Vienna, has published in *Stricker's Jahrbücher* (Pt. iv. 1875) his somewhat extended experience in the Hospital for Children in Vienna, where he sees about thirty or forty cases of inherited syphilis in the year. The first part of the paper is devoted to the question as to the mode in which syphilis is transmitted. The possible methods may be divided into two—(1) Direct transmission by the sperm or germ cell being infected by a syphilitic father or mother; (2) Infection *in utero* from a syphilitic mother. The depth and seriousness of the affections in inherited syphilis, suggest at once that the infection is by the first method, and has involved the creature from its generation, and this view is supported by the author's own observations. Out of 119 cases he finds that the inheritance was clearly from the father in 43 cases, the mother being healthy in that number; both parents were syphilitic in 23 cases, the mother alone in 10; in the remaining 43 cases the mode of inheritance was doubtful. These statistics indicate that the father is most frequently the source of infection, and they corroborate the view that a healthy mother may bear a syphilitic child. He believes, in fact, that this is a frequent occurrence. Intimately related to this is the question whether a child, who is syphilitic from the father, can infect the mother through the placenta? and the author believes that there is no evidence of this. Similarly a syphilis acquired by the mother during pregnancy is not transmitted to the child. The syphilis of the mother may cause abortion, may affect the nutrition of the fœtus; but unless the mother has been syphilitic at the period of conception, she does not transmit it. Syphilis is therefore transmitted either by father or mother only at the period of conception. This leads to some interesting speculations as to the form or vehicle of the syphilitic virus. It must be more stable than that of other infective diseases. It seems only carried by corpuscles, such as those of blood or pus, and such bulky objects are not capable of passing the septa between child and mother. It is not conveyed in milk, or blood serum, or vaccine lymph, unless these contain some such corpuscles. In this respect it differs from the virus of measles or smallpox, which again may be communicated during pregnancy by mother to child. The virus of these is volatile as compared with the more fixed syphilitic poison. Then it is noted that the intensity of the virus diminishes in direct arithmetical proportion with the lapse of time. The first child after a recent infection will die in utero at the fifth or sixth month, the next will live till the seventh or eighth month, then a child may be born alive at full time, but with an eruption of pemphigus, or the eruption may begin during the first days of extra-uterine life, or in later cases not till the second, third, or fourth week, or it may be delayed till the second or third month. If the first occurrence of the eruption is delayed to the third month, the intensity is already much diminished in the parents. It is exceptional for a child to be born alive during the earlier years after infection of the parents, unless mercurial treatment has been used, and almost all children born in the first year are premature. All these facts point to the virus being coarse, and almost measurable in its quantity. According to the author's cases, syphilis may be transmitted fourteen years after the original infection, but on an average it stops at ten years. It may be transmitted during the entire absence of symptoms, and the intensity of the symptoms in the child seems entirely independent of the presence of manifestations in the parent. Lastly, inherited syphilis may intensify other diseases, such as scrofula, phthisis, rickets; but it does not directly produce these. It is a perfectly definite and distinct disease, with characteristic phenomena, which the author in a future paper proposes to describe.—*Glasgow Medical Journal*, July, 1876.

19. *The Spleen and Lymphatic Glands in Diphtheria.*—Prof. C. BIZZOZERO, of Turin, has found in the spleen and lymphatic glands a special lesion which has not hitherto been described. In the spleen of diphtheria, whether enlarged or not, the lymphatic (Malpighian) follicles present in their central parts a collection of cells which are larger than the lymphoid cells of the follicle, and contain several nuclei as well as fat granules; a similar condition is found in the follicles of the intestine and some of the mesenteric glands. Sometimes the process is so advanced that at first sight the whole centres of the follicles, in the spleen or elsewhere, seem composed of granules. The author adds that in two cases of diphtheria he has found a membranous inflammation of the mucous membrane of the stomach, the condition being essentially similar to what is so common in the larynx, but unusual in this situation.—*Glasgow Med. Journal*, July, from *Stricker's Jahrbücher*, Pt. ii. 1876.

20. *Dissecting Aneurism.*—Dr. P. DUROZIER records (*L'Union Médicale*, July 18, 1876) two cases of this, and awards to the late Dr. Pennock of this city the credit of first establishing the true situation of dissecting aneurism in an article published in this Journal in November, 1838.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

21. *Cases Illustrating the Successful Treatment of Suffocative Goitre without Excision of the Gland.*—Mr. LENNOX BROWNE, in a communication made to the surgical section of the British Medical Association, stated that he was compelled to bring forward these cases, because, at the last annual meeting of the Association in Edinburgh, he had taken occasion, on the reading of Dr. Heron Watson's paper on Excision of the Thyroid Gland, to state that such a serious operation was unnecessary, because there were other remedial measures to the full as efficacious and in no way dangerous. There was constant danger from hemorrhage in excision of the gland; and, of seven cases, Dr. Watson had lost one from this cause, even though he had observed the precaution of tying the thyroid arteries beforehand. The variety of bronchocele causing suffocative symptoms was almost always fibrous; and the particular measures to which Mr. Browne referred for cure of these cases were the injection of iodine into the substance of the gland, and the introduction of a seton so as to produce absorption. In the cases to be related, it would be seen that the seton was generally preferable. The relief of symptoms was most rapid and complete. The tumour, as a rule, entirely disappeared; there was never recurrence; there was not the slightest danger, the patient was not even confined to bed; and the after-marking was exceedingly slight. Six cases were related, all of which had been seen by or had been under the observation of other medical practitioners. In all, the result had been successful. The following were points of clinical interest in the cases. In all except the first, in which the cause of dyspnœa was direct pressure on the trachea, as well as on the left recurrent nerve, the tumour lying between the sternum and windpipe, suffocative symptoms and dysphagia were due to the embracing of the windpipe and gullet by extension of one or both lateral lobes. In none was the tumour of large size; the author stated that it was not the dimensions, but the unyielding nature and position of the swelling that caused trouble. In three cases, there were symptoms of considerable sympathetic derangement. In all, there was globus hystericus; and the author mentioned that he had hardly ever seen a patient with this symptom in whom an enlargement of the thyroid, limited it might be, could not be discovered. Treatment of some of the later cases had been completed by a course at the bromo-iodine spa of Woodhall, the great therapeutic merits of which seemed to be but partially recognized by the profession.—Mr. Bell (Bradford) asked the exact method of procedure, as he had a case which he

thought suitable for the treatment advised by the author.—Mr. Jonathan Hutchinson (London) considered the paper one of great value, and especially as to the experience of the author on the question of electrolysis, he having found benefit in only one, and that a very simple form of goitre, out of eight cases. He observed that, of the six cases related, three had been treated by iodine injections, and three by seton; of the three in which iodine was used, suppuration had taken place in two, unexpectedly, it would appear, to the author. He would like to know to which method Mr. Lennox Browne would now give preference.—Mr. Favell (Sheffield) asked if the author would consider the size of the tumour as of any importance as influencing the advisability of operating. He had recently seen a very enormous goitre occurring in a young gentleman, causing such severe dyspnœa as to cause death.—Mr. Barber (Sheffield) inquired if the author would operate in patients of advanced age. He observed that, in those cases which had been related, no patient had been above middle age. Mr. Lennox Browne, in reply, said that, in employing the syringe or seton, local anæsthesia might be used. It was quite true, as the President of the Section had suggested, that he attributed the benefit of the iodine to the suppuration which had been induced, and for that reason he gave preference to the seton in cases of fibrous goitre. It was important to insert and to bring out the needle as far back as possible. He would not regard the size of the tumour as a bar to operation, and had seen very considerable goitres reduced by the seton. He had advised the seton in the case quoted by Mr. Favell, and, viewing the result, one could not but regret that it had not been tried. He had operated on patients much older than those whose cases had been related. He never advised operation of any kind except for dyspnœa, but he had frequently performed it when asked to do so, on account of disfigurement.—*Brit. Med. Journ.*, Aug. 26th, 1876.

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22. *Treatment of Fractures of the Skull.*—Mr. W F. Favell, in his interesting address on Surgery at the recent meeting of the British Medical Association, after referring to the marked change of treatment which has taken place in the treatment of fractures of the skull, and quoting the opposite views of Pott, Abernethy, and Lawrence on one side, and Prescott Hewett and Erichsen on the other, says: "Perhaps the most obvious cause of these diverse opinions lies in the fact that, in cases of depressed fracture, we can hardly lay down a hard and fast line of treatment—much must be left to the careful and anxious consideration of the surgeon unhappily meeting with such cases. I think recent experience has abundantly proved that compound depressed fractures of the skull in adults do get well without operative interference; and, in illustration of this fact, I beg for a moment to refer you to three cases published in the *British Medical Journal* of July 8th by Mr. Gamgee, of Birmingham. Here we find rapid and uninterrupted recovery from compound depressed fracture of the skull in adults, one man being fifty-five years of age, and the other two twenty-five years old. They were all treated by perfect rest, cold to the head, and aperients. I could adduce other instances, but I refer to these as cases recently published, and probably familiar to many readers of the *Journal*.

"On the other hand, it is a well-known fact that such happy terminations are by no means constant, and that the trephine or some similar instrument has sometimes to be used to relieve inflammatory symptoms, which occur as the results of irritation set up by the fractured bone, or to give exit to pus; even then recovery is by no means to be despaired of, though, of course, operative interference under such circumstances is far less promising than when undertaken without the inflammatory complication. Referring to my notes of cases in the hospital, I find that only once in the last five years have I had recourse to the trephine, and I did so in what, I almost think, is a typical case for operation.

"H. D., a woman, aged 39, was brought into the infirmary with a history that she was engaged in some street row, and was knocked down by a stone thrown into the crowd. I found a large wound leading down to a comminuted punctured fracture, the portions of bone being driven deeply down. There were no head-symptoms. Finding it impossible to pick out the depressed portions with

forceps, I removed a semicircular piece of the sound bone with a trephine, and was able then easily to remove six comminuted portions of bone, some of them driven under the uninjured bone, and amounting in the aggregate to a piece as large as a half-crown. The dura mater was scratched, but not punctured. The woman was kept quiet, with cold to her head, and made a rapid recovery without any untoward symptoms. I think I may instance this as a case in which it is extremely doubtful whether so fortunate a result would have been obtained had I refrained from operation. I think, perhaps, there is a tendency in these days to overrate the danger of operative interference in such cases; for, where grave bone injury already exists, and where air has already had access to the dura mater, and probably also foreign bodies, such as grit and dirt, it is open to question whether an operation, such as I have just described, performed with all possible care and delicacy of manipulation, adds very materially to the existing danger.

"Certainly, I should be little disposed to lay down a defined line of treatment in cases such as I have been describing. Much must be left to the discretion and anxious thought of the surgeon, and whilst bearing in mind on the one hand that depressed compound fractures of the skull, even in adults, do get well without operation, one ought not to hesitate to interfere where the existing conditions of the fracture are such as to make one feel that there is probably less risk in interference than in simply waiting for results."—*British Medical Journal*, August 5, 1876.

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23. *Fracture of the Trochanter Major.*—Dr. F. W. WARREN submitted to the Dublin Pathological Society (Jan. 22, 1876) an example of this extremely rare injury, obtained from a dissecting room subject, a man apparently about 50 years of age. Through the base of the trochanter major there is a distinct fracture passing obliquely downwards and backwards, the detached trochanter being drawn upwards and inwards so that its summit projects above the level of the head of the femur. The tendinous expansions which cover the process are intact. Owing to the detached fragment being drawn upwards by the action of the muscles, the lower part of the fractured surface of the femur corresponding to the original site occupied by the trochanter is exposed, and, by passing the finger over it, presents to the touch a rough sensation. The detached trochanter is firmly connected to the shaft by dense ligamentous tissue, and into its apex is inserted the glutæus medius, the glutæus minimus being attached along its antero-lateral margin. When compared with a bone, prior to the union of the trochanter to the shaft through its epiphysary line, the fracture is found to take a direction exactly corresponding to the epiphysary line. On comparing the specimen with the opposite healthy femur, the fractured surface of bone corresponding to the original site of the detached trochanter presents an obliquely flattened surface exactly corresponding to the epiphysary plane, and which, when traced upwards, is directly continuous with the upper part of the neck of the thigh-bone. There are no osteophytic growths of any kind. The hip-joint is perfectly healthy, and there is not the slightest appearance of any recent injury or violence.—*Dublin Journ. Med. Sci.*, July, 1876.

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24. *Fractures of Bone in the immediate vicinity of important Joints.*—Mr. FAVELL, in his address on Surgery before the British Medical Association at its recent meeting, justly remarks: "There are few cases in surgery in which the accurate diagnosis is often more difficult, the anxiety involved greater, and the results less satisfactory, than in cases of this nature. Every practical surgeon is familiar with the impaired utility of wrist and hand which we occasionally see, particularly in old people, as a consequence of the fracture of the carpal end of the radius; and again, impaired mobility of the elbow-joint is not unfrequently seen, as a result of fracture through some portion of that complicated and important articulation; and I venture to say that such consequences are sometimes unavoidable, in spite of the most carefully conducted treatment; nay, I think I may go even further, and assert that cases do occur in which the surgeon, by skilful and carefully conducted treatment, has obtained the best

results he could hope for, and which still are failures in the eye of the patient, ignorant as he is of existing conditions and almost inevitable consequences.

"Surely, gentlemen, these considerations should teach us a lesson; they should teach us to look very charitably upon alleged failures in treatment, or upon so-called cases of malpractice. It is one thing to criticize the treatment of a deformed or distorted joint weeks, or perhaps months, after the receipt of injury, when all *immediate* effects of such injury have disappeared; but it is a very different thing when contusion, inflammation, swelling, and pain obscure the injury and interfere with manipulation, so to direct our treatment, as always to insure a satisfactory result.

"The case to which I wish to direct your attention for a few minutes, and which, through the kindness of my friend, Mr. Wheelhouse, I am enabled to illustrate by a very instructive preparation, is one of dislocation of the hip, complicated, as I believe, by fracture of the acetabulum, that is, of the rim of the acetabulum.

"A. B., a young man, a commercial traveller, was standing on the platform at a railway station, when he saw the train by which he wanted to travel passing rapidly through the station; he ran up to it, sprang upon the foot-board, and attempted to grasp the door of a carriage, but, being swung round by the momentum of the train, he was unable to keep his hold, and was thrown violently upon the rails, rolling over and over when he came to the ground. He lay stunned for a few minutes, and, when he attempted to get up, found his right leg so injured that he could not rise. He was carried into the waiting-room, and was seen very shortly afterwards by Dr. M., the railway company's local medical officer. This gentleman made a very careful and deliberate examination of the injured limb, and, as manipulation gave great pain, he put the sufferer under the influence of chloroform, so as to give himself every opportunity of arriving at a correct estimate of the nature of the injury. After nearly an hour's examination, he came to the conclusion that there was no dislocation, no fracture, but that the man was suffering from severe contusion. Afterwards, the sufferer was carefully laid in a railway carriage, and conveyed to his home in Manchester. Here he sent for his own surgeon; the same examination again was gone through, and the same result arrived at. As soon as the subsidence of swelling allowed it, a long splint was applied to keep the part perfectly at rest; and subsequently, as much pain about the hip was still complained of, his medical man, for his own satisfaction and that of his patient, called in a third surgeon, a man whose extended experience in cases of accident was undeniable. He found the limb lying flatly on the bed beside its fellow; careful measurements, conducted in the orthodox manner, proved that the injured limb was as long as, and at one time rather longer than, its fellow; and he coincided in the conclusions already formed, and in the propriety of the treatment adopted. And so the limb was kept at rest for some time longer. Here, then, we have three surgeons, separately and carefully examining this hip, and arriving at the same conclusions. But mark what followed in this singularly interesting case. When lapse of time and subsidence of pain warranted it, the splint was removed, and he was allowed to get up and attempt to move about. He did so, and attempted to bear some slight weight upon the injured leg, and *after* that he noticed, *for the first time*, that the injured leg was rather shorter than the sound one. This amount of shortening speedily increased to the extent of a couple of inches, with inversion of the foot; and, to cut a long story short, he consulted a fourth surgeon, who told him that his hip was dislocated; and eventually an action for damages ensued. In consequence of this, Mr. Wheelhouse, of Leeds, and I were asked to examine the case, and give evidence upon it. When we saw it, several months after the accident, the evidences of dislocation were clear enough; there were the characteristic shortening, the inverted foot, and the round head of the bone clearly resting upon the dorsum of the ilium. One of two things, then, must have happened in this case. Either (as was alleged) dislocation of the hip had occurred at the time of the accident, and had been overlooked, or else dislocation had taken place subsequently, as a result of some obscure injury to the joint. Against the first hypothesis were the testimony of three surgeons, who

had all examined it carefully for dislocation or fracture, the fact of the absence of deformity, and the absence of shortening of the limb: whilst in favour of the latter hypothesis, in addition to what I have just stated, was the fact that no shortening took place till the man put weight upon the leg, and then it was immediately noticed. The only way in which one could reconcile the fact of undoubted *present* dislocation, with a history so opposed to its existence for some time after the accident, was on the hypothesis that, at the time of the accident, which was a very violent one, there was fracture of the rim of the acetabulum; that, so long as no weight was put upon the leg, the head of the femur remained *in situ;* but that, as soon as weight was borne upon the leg, the head of the bone escaped from the damaged acetabulum, and was soon drawn up upon the dorsum of the ilium. This theory was very ably argued by Mr. Wheelhouse, and surely it was a reasonable one—more reasonable than that a dislocation presenting such marked features as dislocation of the femur on the dorsum ilii, should have been overlooked, though carefully searched for, by so many surgeons of ability and experience; and, though the probability of such an occurrence was denied, I am in a position, through the kindness of Mr. Wheelhouse, to show you a preparation taken from a case of accident admitted into the Leeds Infirmary, since the occurrence I have just related, which admirably illustrates the argument then urged. The case was admitted into the infirmary for injury to the hip and severe internal injuries. Dislocation was diagnosed, and reduction readily effected. The patient lay in bed some days, and then died from internal injuries. During the removal of the patient from the bed, the hip, which had been in perfectly good position so long as the man was at rest, again became dislocated, and a *post-mortem* examination revealed the condition I now show you, viz., 'fracture of the rim of the acetabulum.'

"Erichsen, speaking of the treatment of such cases, says: 'But with every care, a return of displacement will readily take place, and an unsatisfactory result can scarcely be avoided—shortening of the limb, and consequent lameness, being almost inevitable.' Cases such as this one I have just related are of immense practical interest both to the surgeon and his patient; certainly the patient has a right to expect that everything shall be done for him that careful judgment and judicious management can effect; but how often does the surgeon get undeserved blame, when he has the misfortune to treat an injury so complicated that, in spite of all care and skill, he cannot avert an unsatisfactory result. I can imagine and excuse a man being angry, when he finds himself permanently crippled by an accident, which at first, to all appearance, may not have seemed of a very formidable nature; but surely we, fellow-workers, all so fallible, ought to criticize the work of our brothers in a spirit of the widest charity."—*British Med. Journal*, August 5, 1876.

25. *New Method of Reducing Dislocations of the Shoulder.*—Dr. KUHN, of Elbeuf, describes a new method of reducing dislocations of the shoulder. He says it is impossible to ignore the difficulties which often attend the reduction of dislocations of the shoulder. These difficulties are partly owing to the fact that the scapula follows the traction made on the humerus, which causes a loss of a large part of the force employed for the stretching of the muscles.

By adopting the reverse method, that is to say, by applying the force to the scapula whilst the humerus is the fixed point, we no longer reduce the humerus; on the contrary, we fix it and reduce the scapula. There is no loss of power, as it is easy to prevent the arm from following the scapula. The difficulty which is found in reducing these dislocations, however, arises not only from the mobility of the scapula, but also from the power of the muscles, which it is necessary to put on the stretch. It is easy to see that, by this new method of operating, we shall not have to overcome the resistance of the pectoralis major and latissimus dorsi, but of the scapulo-humeral muscles (subscapularis, supraspinatus and infraspinatus, and teres major and minor), which are much smaller and less powerful than the former.

Since the discovery of anæsthetics, we can overcome the resistance of muscles, by chloroform and ether, the administration of which ought to be pushed until relaxation of muscles is produced. Many practitioners, however, are

opposed to the use of these sometimes dangerous means for an operation generally so little serious as the reduction of a simple dislocation of the shoulder.

By following out these principles it is possible, more often than not, even alone and without assistance, to reduce a dislocation of this nature. A cushion of a conical shape is to be placed in the axilla, the base of the cone being downwards; the surgeon, standing at the patient's side, lightly draws the arm downwards, and at the same time presses it firmly against the pad in the axilla, so as to make it into a lever of the first kind. Then, taking the inferior angle of the scapula in the other hand, he raises that bone and gives it a see-saw motion. Coaptation soon follows, the two parting return to their natural position, by a simultaneous effort made on the lower extremity of the humerus and the inferior angle of the scapula. If the head of the humerus be displaced. forwards, the angle of the scapula should be directed outwards, at the same time that it is raised. It should be directed inwards if the dislocation be backwards. If any difficulty be experienced in making the reduction, the task of holding and directing the arm should be confided to an assistant.—*London Med. Record*, July 15th, from *Gaz. Med. de Paris.*

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26. *Removal of Spleen.*—M. Péan exhibited to the French Academy of Medicine, July 18, two patients upon whom he had successfully performed ablation of the spleen, in consequence of large tumours of the organ. The first was operated upon in September, 1867, and was shown to the Academy soon afterwards, since when she has continued to enjoy excellent health. The second, a woman twenty-four years of age, was operated upon three months ago, in consequence of the success that had been obtained by M. Péan in the first case, and in gastrotomy in general. An incision having been made from the pubes to the epigastrium, the hypertrophied spleen was found extending from the left hypochondrium to the right iliac region. Owing to its friability, great precaution was required in removing it, a ligature having first been placed around the omentum *en masse* prior to the excision. The omental stump, containing some enormous sanguineous and lymphatic vessels, was brought down to the lower angle of the wound. Very little blood was lost; and the patient, at the end of a month, was enabled to resume her occupation in a good state of health, and completely cured.—*Med. Times and Gaz.*, July 29, from *Bull. de l'Acad.*, No 29.

These cases are reported in full in *L'Union Médicale* for July 29, 1876. Of six cases of splenotomy which have been reported in the last twenty years, two only, M. Péan says, have been successful.

In the *British Medical Journal* for July 8, 1876, it is stated that Dr. J. Marion Sims "assisted at a case of excision of an hypertrophied spleen, which weighed between eleven and twelve pounds."

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27. *Acute Arthritis of the Knee-Joint, and Necrosis of the Entire Shaft of Tibia in an Infant.*—Mr. George Brown read to the Clinical Society, May 26th, an account of a case of this in which amputation was performed, followed by recovery. He began by stating that he brought the case before the notice of the Society on account of the interest which attaches to the rare and grave surgical disease which necessitated the performance of the operation; and because he believed that it was the first case in which amputation of the thigh had been followed by recovery in a patient less than twelve months old. The patient, Jane P., aged eight months, was brought to Mr. Brown, at the Islington and North London Provident Dispensary, on December 23, 1875, apparently suffering from an affection of the knee-joint. Up to the previous evening the child was quite well. When first seen the child was well nourished, but had cut no teeth, and had an anxious expression of countenance. The right knee was slightly swollen; the leg was semi-flexed, and hotter to the touch than the left. No fluctuation; no history of injury. The patient was evidently suffering much pain; refused food, and was unable to sleep. Next day the swelling of the knee had increased; the temperature rose to 103°; and the pulse was 140. The swelling of the knee and leg continued to increase until the 28th, when the right knee and calf were three inches larger in circumferenc

than the left. Distinct fluctuation could be detected all around the joint and about three inches down the leg. On the 29th the leg was opened just below the patella, and seven ounces of purulent matter were evacuated, containing a quantity of large curdy flakes, with some oil globules. On passing the finger into the wound, the tibia could be felt quite rough, and denuded of periosteum as far as the finger could reach. The epiphysis was felt to be detached from the shaft. The temperature was then normal, to which condition it had fallen suddenly on the 28th. After abscess was opened, the patient appeared to suffer much less pain, and went on well for some days; but on January 5, she had an attack of vomiting; the leg became erysipelatous. The temperature rose to 104°, and continued very high for several days. The wound discharged pus freely, and the erysipelatous condition of the leg continued until January 23. Meantime the patient became much emaciated, and was gradually sinking. Mr. Brown then proposed amputation, to which the parents consented; and he performed the operation, assisted by Mr. F. H. Hume and Mr. Sebastian Gardner, on January 25. The thigh was amputated in the lower third by the lateral flap method. After the operation was completed, the child became cold, blanched, and pulseless, and only recovered from the shock and the effects of the chloroform after artificial respiration had been kept up for some time. The stump healed almost entirely by first intention, but a small sinus remained open for nearly three months. A small spiculum of bone was then removed from the sinus, and it healed up at once. On examining the amputated limb, it was found that the entire shaft of the tibia was denuded of periosteum and necrosed; the epiphysis was completely separated from the shaft, and in it was an abscess-cavity, which opened by a small pin-hole into the joint about the centre of the external semilunar cartilage; the articular cartilages of the joint were otherwise healthy. The synovial sac was slightly thickened. Mr. Brown was of opinion that the original lesion was a subarticular abscess in the epiphysis—probably of scrofulous origin, as no history of congenital syphilis could be obtained. This abscess first opened into the joint, and gave rise to the acute inflammation for which the patient first came under treatment. Later, the abscess extended downwards to the periosteum, causing acute periostitis and rapid necrosis of the shaft. Such cases were, fortunately, rare, and seldom came under the notice of surgeons, excepting those who have extensive practice among children. Mr. Thomes Smith has described the disease very fully in the *St. Bartholomew's Hospital Reports* for 1874, and given notes of several cases which came under his notice at the Children's Hospital, most of which terminated fatally in a rapid manner. Mr. Smith had named this disease "acute arthritis of infants." Mr. Barwell, in his work on "Diseases of the Joints," published in 1861, quotes from Stromeyer a description of a similar affection, but adds that up to that time he had never seen a case of the kind himself, neither could he find any record of a case in the writings of English surgeons. The presence of erysipelas, Mr. Brown remarked, is generally held to contra-indicate the performance of a surgical operation. In this case there was well-marked cutaneous erysipelas of both legs on the day appointed for the operation; but as it was evident that the child was rapidly sinking, it was decided to amputate at once, and run the risk of erysipelas attacking the stump. The result of the case, Mr. Brown observed, shows the wisdom of the course adopted. —*Med. Times and Gaz.*, July 8, 1876.

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28. *Subcutaneous Osteotomy.*—Mr. MAUNDER read before the Clinical Society (May 12) a paper on subcutaneous section of bone, and exhibited patients to show how great and important results may be obtained with comparatively little risk. The femur was the bone concerned in all the five cases. Two of these operations had been performed on the same patient, with an interval of some twenty months. This patient, M. A. J., now ten years of age, had been the subject of hip-joint disease, which had left the left thigh fixed by fibrous anchylosis at a right angle to the line of the spine, the head of the femur being wasted and displaced upon the dorsum ilii. Notwithstanding section of contracted muscles and subcutaneous division of the neck of the bone, as suggested by Mr. William Adams, the deformity was in no way lessened, and Mr. W.

Adams himself also failed a week subsequently in a similar case. This failure led the author to consider how otherwise to act. The outcome was the operation described, illustrated with such gratifying results. After alluding to Messrs. Broadhurst, L. S. Little, W. Adams, and Gant, as pioneers in this department, he pointed out that while a certain number of cases of deformity at the hip-joint were remediable by section of the neck of the femur, a large number of instances of deformity in this region were not suited to that operation, but could be readily relieved by a division of the femur at a suitable point below the upper extremity of this bone. Three cases were given, of which that of the child M. A. J. above alluded to is typical. The first operation on her having failed, a second was performed, but below the lesser trochanter. Operation: Following the method suggested by Professor Volkmann, of Halle, Mr. Maunder uses chisels and a mallet. He employs a double-edged knife for the puncture of the soft parts, and lays great stress upon dividing these in such a manner that when the operation is completed, the wound in the skin shall not communicate directly with the wound in the bone. He advocates, also, great care when one instrument is replaced by another, as the knife by a chisel, and one chisel by another, the one instrument being used as a guide to the other. The wound may or may not be closed by a catgut suture, and a compress and strapping are employed. Bony union must be encouraged by rest and a suitable splint. He deemed it important, also, to support the soft parts about the wound in order to prevent oozing into the track of this by the application of a sand-bag after the patient had been returned to bed. Such was the nature of the second operation on M. A. J. above mentioned. After both, primary union of the soft parts occurred. The child was shown, standing erect, and with her lower extremities parallel. Another instance was that of a young man, twenty-one years of age, who had been the subject of hip-joint disease for seventeen years, and in whom a discharging sinus still existed and does exist. The same operation was performed, and the deformity has been remedied; he can stand erect with the lower extremities parallel. Possibly the most interesting case, and that showing the great importance of osteotomy, was that of Richard H., aged thirty. He was a sailor by occupation, and having broken his left thigh at sea, and being without surgical aid, the fragments had united at an awkward angle and with complete eversion of the foot. The man stated that the leg was perfectly useless to him as a sailor by reason of this eversion of the foot, and was most anxious to have something done to remedy this condition. Here the shaft of the bone was divided; the foot could then be turned to the required position, and was so maintained. The wound healed primarily; the man never had an ache or a pain or a disturbed night, and in six weeks bony union had occurred. Thus this patient, who at thirty years of age was deprived by the accident of his means of livelihood to which he had been educated, was by the operation restored to usefulness. In contemplating osteotomy in reference to the upper extremity of the femur, the point at which the bone is to be divided must depend upon the altered and relative condition of parts. Mr. W. Adams's operation (section of the neck of the thigh-bone) appears to be applicable to cases of anchylosis and deformity in which the head of the bone remains in the acetabulum, both without material loss of substance, and also in the absence of much surrounding thickening about its neck. On the other hand, if there be great thickening, requiring an extensive use of the saw, so as to leave large surfaces of sawn bone in apposition, this extent of surfaces alone will prevent a restoration of the extremity to the desired position, and small benefit only will result from the operation. Also, cases of hip-joint disease associated with more or less loss of substance, displacement of femur, fixity of its upper extremity by fibrous anchylosis and shortened muscles, and distortion of the limb, are not suited to it, as was proved by the first operation on M. A. J., where the deformity could not be remedied by it. Here it is that section of the bone below the lesser trochanter will make the surgeon quite independent of the fixed upper end of it, and will allow him to place the extremity in any position he may think fit, and insure the greatest prospective benefit to his patient. Thus it will be evident that the large majority of cases of severe deformity resulting from disease of the hip-joint, will be best remedied

by the division of the thigh-bone at some point below the lesser trochanter, whilst a minority will still remain best suited to section of the neck of the bone. The author felt justified in saying that the three patients whom he exhibited illustrated the value of the operation described, and the result is that they who were previously burdens upon, can now become useful members of, society.

Mr. William Adams said the members of the Society would congratulate Mr. Maunder upon the success of his operation of partially dividing the shaft of the femur below the small trochanter, subcutaneously, by means of the chisel and mallet; and then breaking through the remaining portion, so as to allow of the limb being afterwards set in a straight position, and firm union obtained. In the three cases exhibited, deformity had been overcome, and the limbs were both straight and useful. This operation will be found applicable to a class of cases in which the operation of subcutaneous division of the neck of the femur cannot be performed, in consequence of structural alterations from disease in the head and neck of the bone. Another operation, in the same situation, and applicable to a similar class of cases as Mr. Maunder's, had previously been performed by Mr. Gant, who used the small subcutaneous saw instead of the chisel and mallet, partially dividing, and then breaking the bone. Mr. Gant has twice performed this operation successfully, no suppuration occurring in either case. Mr. Adams observed that he had also twice divided the shaft of the femur subcutaneously with the small saw for badly united fractures; and once the shaft of the humerus, for straight anchylosis of the elbow-joint. In one case no suppuration followed, and but very little in the other. Subcutaneous osteotomy, Mr. Adams observed, has of late received a great stimulus, but bones cannot always be divided with the same degree of safety or freedom from inflammation as tendons, though the great majority of the cases operated upon have proceeded just as favourably as subcutaneous tenotomy. There are now three subcutaneous operations for dividing the neck or shaft of the femur in cases of bony, and sometimes in fibrous anchylosis of the hip-joint—cases which were not previously amenable to treatment, except by operations of such magnitude as those of Rhea Barton of Philadelphia, and Sayre of New York. 1st. The operation proposed by Mr. Adams, of subcutaneous division of the neck of the thigh-bone, applicable to all cases of anchylosis in which there is but little diminution in size or alteration in shape of the head and neck of the femur. Twenty-four of these operations have been recorded, with only one death from pyemia, and one eight months after the operation from chronic suppuration with kidney disease. 2d. Mr. Gant's operation of dividing the shaft of the bone subcutaneously with a small saw just below the small trochanter, applicable to cases in which the neck of the femur could not be divided in consequence of the structural alterations from disease. 3d. Mr. Maunder's operation in the same situation as Mr. Gant's, and applicable to similar cases, but performed by means of the chisel and mallet. Mr. Adams's experience led him to prefer Mr. Gant's operation when the neck of the femur cannot be divided, and he believed that the small subcutaneous saw will be found a more manageable instrument than the chisel and mallet.

In reply to a question by Mr. Sydney Jones, Mr. Adams stated that he had not succeeded in retaining motion in any of the five cases in which he had divided the neck of the femur, but Mr. Jessop (of Leeds), Mr. Lund (of Manchester), and Dr. Sands (of New York), had all succeeded in retaining motion.—*Med. Times and Gaz.*, June 17, 1876.

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29. *Osteotomy in France.*—A long discussion lately took place at the Société de Chirurgie of Paris, on the subject of osteotomy in the treatment of rickety deformities, during the course of which the opinions of many French surgeons were elicited. M. Jules Boeckel, of Strasburg, described thirty-four cases of osteotomy, performed in some cases for rickets, in others for extreme deformities from other causes, and in all the operation was successful. The most promising age he concluded to be from fifteen months to seven years, after, of course, the deformities have become fixed, and treatment by other means has become impracticable. The method recommended by M. Boeckel is to place a chisel in an opening made through the skin and periosteum, and divide the

bone by a few blows with a mallet. He prefers to complete the section of the bone at the time—not, as some surgeons have recommended, to allow the wound to heal, and then to complete the division by external violence. After the section the limb is, of course, kept immovable by a plaster bandage. In some cases, the removal of a wedge of bone was necessary. M. Alphonse Guérin pointed out that osteotomy for rickets was practised in 1838 by Jobert (de Lamballe), although his operation was not subperiosteal. Most of the subsequent speakers agreed with M. Blot in deprecating the operation at the early age at which it had often been performed. This was the opinion of M. Léon le Fort, who would limit osteotomy to children of ten to twelve years, believing that other means will, at earlier ages, effectually conquer even the most extreme rickety deformities. He expressed the opinion that English and German surgeons have not, in early cases, given sufficiently long trial to other methods of treatment. He showed casts of the legs of two children, one of five and the other of eight years, who had been unable to walk in consequence of extreme curvature, and in whom the deformity was completely removed in fifteen months and two years by simple mechanical appliances. He believed that the chisel rendered the operation less grave, but believed that it was only trivial at the early ages, at which it was really not needed; while at the later ages, at which alone its performance was justified, it was really a much more serious matter than had been asserted. In the subsequent discussion, the treatment of rickets and that of the deformities were not carefully distinguished. M. Verneuil and M. Marjolin, both opposed osteotomy, and the latter quoted some statistics of M. Perrochaud, surgeon to a seaside hospital at Berck, which were held to prove that rickets could be cured by simple residence at the seaside. Curiously enough, the diet on which the children in the hospital were put, seems not to have been considered of the least importance. As the cases treated were of the age of two to eight years, it is obvious that they included both the condition of rickets and its consequences; and, as M. Tillaud subsequently pointed out, the deformities caused by rickets, often continue to adult life, and are amenable only to operation. He urged French surgeons not to repeat the error they committed in 1866, when they rejected osteotomy altogether.

But the French surgeons, in speaking of osteotomy as an English and German operation, lost sight of the careful study of the treatment of rickety deformities which M. Jules Guérin brought before the profession in 1843, and of which he has recently reminded the Académie de Médecine. His treatment was founded on a careful study of the pathological anatomy of the diseased bones. Osteoclasm, the fracture of the bone, should not, he maintained, be compared with osteotomy, since it is applicable only to a different period, in which the bone is, in the main, composed of soft material; but a shell of bone resists straightening, a shell which may easily be broken. During the "second period" of rickets, osteoclasm should, he believed, always be preferred. It is certain, however, that in this period the deformity is still, to a great extent, amenable to other measures. Osteotomy, M. Guérin employed at a later stage, and combined it with division of tendons. He usually had recourse to partial subcutaneous section, dividing the concave side of the bone, while the corresponding portion of the concavity is preserved intact. This is a very important difference between him and his successors, since, in his operation, the limb does not undergo the shortening which results from the removal of a wedge-shaped piece from the convex side. He strongly insists on the advantage gained by the "subcutaneous" method.—*Lancet*, July 15, 1876.

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30. *Resection of the Rib in Empyema.*—Dr. Peitavy records two cases of empyema, treated by resection of a portion of the rib, for the purpose of permanently widening the aperture, and so facilitating both the discharge of pus, and the injection of fluids. In the first case, aged sixty-four, pus was removed by incision six weeks after the first symptoms. In spite of washing out the chest by the double catheter, injection of tincture of iodine, and the use of a drainage-tube, pus was retained and the patient suffered from fever with evening exacerbations, rigors, loss of appetite, and increasing weakness. Attempts

to dilate the aperture with laminaria caused great pain, and it became impossible to wash out the chest properly. Finally, five months after the incision, a portion of the seventh rib, somewhat more than an inch in length, was removed with the chain-saw. Pus escaped, a drainage-tube was inserted, and the symptoms were relieved from that time. The tube was removed after a month, and in another fortnight the wound had closed. In the second case, aged fifty-six, the result was less striking. Two weeks after the first incision, and only seven weeks after the first symptoms, a portion of the eighth rib was excised and a tube inserted. Fever however continued, and, as injections caused coughing and dyspnœa, the tube was removed after twelve days. The case was complicated by a bronchial fistula, but was completely cured about two months after the resection. A third case of empyema is recorded from the practice of Professor Simon, in which resection of the rib acted not so much by allowing the free discharge of pus, as by permitting the approximation of the ribs and the obliteration of the cavity. Peitavy prefers resection to Fräntzel's practice of fixing in a silver canula, because it is less painful, less irritating to the pleura, and tends to diminish the size of the cavity.—*London Med. Rec.*, August 15, 1876, from *Berliner Klin. Woch.*, May 8, 1876.

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31. *Union by Ligature of divided ends of Nerves.*—Mr. FAVELL states (Address on Surgery) that some months ago he had an opportunity of examining in the Leeds Infirmary a case then under treatment, in which Mr. Wheelhouse had cut down upon, resected, and united by ligature, the divided ends of a sciatic nerve, which had been accidentally cut across some months previously. The history of the case was briefly as follows:—

The patient, a man aged 22, nine months before admission, was climbing over a fence, when the railings gave way, and he fell backwards upon a scythe which he was carrying. The wound, which must have been an extensive one, as the cicatrix measured nine inches, was situated just below the left buttock. At the time of admission, he was able to walk with difficulty, there being considerable dragging of the left leg, and, as he lifted it, the toes fell to the ground. He was unable to use the muscles of the back of the leg, and there was loss of sensation on the outer side of the leg and foot, the inner side retaining sensation. These conditions, taken in connection with the situation of the cicatrix, led to the inference that the great sciatic nerve had been divided resulting in paralysis of parts supplied by that nerve below the seat of division. The operation consisted in making an incision six inches in length in the course of the sciatic nerve, when the divided extremities were found an inch and a half apart, the upper segment being bulbous, the lower one flattened, and somewhat incorporated with the cicatrix. The two extremities were then cut off, the divided ends brought together, and retained by sutures of carbolized catgut. This was facilitated by flexing the leg upon the thigh, in which position it was retained for some time. The man made a rapid recovery. When I saw him, two or three weeks after the operation, cicatrization was almost complete, though the leg was still retained in its flexed position; but there was ample evidence afforded of returning sensation on the outer side of the leg and foot. In this case, the restoration of sensation and motion appears to have been very gradual; but Mr. Wheelhouse informs me that, since his discharge from the hospital, the patient has gone on steadily improving, and gaining power in his former paralyzed limb.

I have also the notes of a case of division of the median nerve by a wound from glass. It was treated in the same way, ten weeks after the accident happened; but the result does not appear to have been so satisfactory, as, though some amount of return of sensation and motion followed the operation, as the wound healed and cicatrization progressed, the sensation gradually diminished and numbness increased.

Two other cases I have records of, in which the divided ends of the nerves were brought together by suture immediately after the accident. In one case the median nerve, and in the other the ulnar nerve, were entirely divided. Both cases were boys of fourteen years of age. In one month from the occurrence

of the accident, both boys were discharged with their wounds healed, and sensation was perfect in each instance.

Now, I think I may instance these as four very suggestive cases. Perhaps they teach us no new facts in pathology; but, practically speaking, I think they are of importance. It will be observed that, in the two cases in which some weeks elapsed between the receipt of injury and operation, the results were in one case very gradual and slow in their development, and in the other case satisfactory; but in the two cases in which operation immediately followed the accident, sensation, at all events, was rapidly re-established. Now, experience has amply proved that regeneration of nerve-tissue after nerve division readily takes place more or less perfectly under favourable conditions. Dr. Hassall says: "The regeneration of the primitive nerve-tube admits of proof both by experiment and direct observation. The experimental proof consists in the simple division of nerves, or even in the removal of portions of them. The parts to which the nerve is distributed of course at first lose their sensory and motor endowments; these, however, after a variable time, are more or less perfectly recovered, thus completing the experimental proof. The recovery of the power of a nerve after the excision of a portion of it, argues strongly the fact of the regeneration of the nerve-tubes; and this result, by a careful microscopical examination, can be positively demonstrated. The number of tubes in the renewed part of the nerve is stated, however, to be less than in the original portions; and this, in part, explains the reason of the restoration of the functions of a divided nerve being usually but imperfect." Every surgeon, too, is familiar with the fact, that parts which have been completely severed, such as tips of fingers, will, if reunited, regain sensation, though the nerves have been completely divided. Thus, under favourable conditions of position, we may look for such an amount of return of sensation and power of motion in parts supplied by divided nerves, as shall not materially interfere with future usefulness; but the practical lesson to be learned from such cases as these is, that we may with safety so manipulate nerves as to insure such conditions of position. Perhaps the very painful, and sometimes even disastrous, result which has followed the ligature of an important nerve, has deterred surgeons from interfering with them when divided. Sir A. Cooper records two cases of death from this cause—one from the ligature of the sciatic nerve to arrest hemorrhage from an artery in its substance, and another in which the popliteal nerve was accidentally included in a ligature put round the artery. In both cases violent pains and death resulted.

In the cases I have recorded, I find complaint of much pain after operation in only one case—the first one operated on, in which the sciatic nerve was the one implicated. In this case there seems to have been great pain on the day of operation and the day following, but in the other three no mention is made of any disturbance caused by the operation. Probably the use of catgut-suture, which, we know, soon dissolves, and the fact that the sheath of the nerves was carefully selected, as the portion to be principally included in the sutures, may have had much to do with such fortunate results.

As a beginning, then, I think these four cases are both interesting and encouraging. If, in the case of a limb left paralyzed by division of an important nerve, we can afterwards cut down upon, resect, and reunite such nerve, so as to restore power and sensibility to the parts supplied by it, at no great risk, much has been gained; and in cases of extensive wound or laceration, involving important nerve-trunks, these records raise the question whether it is not better not to be simply content with ligaturing bleeding vessels, and leave the nerve-trunk to the chance of assuming its original position, by carefully and accurately closing the wound, but to insure the coaptation of its divided ends by the careful introduction of catgut-suture.—*Brit. Med. Journ.*, Aug. 5, 1876.

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32. *Sulphurous Acid Wash as an Antiseptic in Country Practice.*—Mr. John Balfour strongly recommends (*Edinburgh Medical Journal*, Aug. 1876) sulphurous acid wash originally advised by Dr. Dewar, as a valuable antiseptic for the use of the country practitioner, who may be called on at any moment to operate in slight cases without any assistance, and to perform a capital ope-

ration with such aid as may on the spur of the moment be available. He says he has now used it "for many years with great satisfaction in all cases of factory accidents, cuts, and lately in a case of amputation at the shoulder-joint. In the proportion of one in twelve of water, I find that it at once alleviates pain, minimizes suppuration, is easily applied, and facilitates dressing the wound, while it costs almost nothing. When the fingers are the parts injured, I have a large teacup filled with the wash put by the patient's side, and into this the injured part, covered with the thinnest rag to be had, is dipped as often as desired. Should the injured part be the hand or any other part of the body, it is supported on a pillow covered with gutta-percha tissue or oilskin, and the wash is applied by means of a little tow, which is allowed to remain in the cup."

33. *Fissure of the Anus in Children at the Breast.*—Fissure of the anus, so common in adults, is very rare in infancy. Dr. MARBOURG records (*L'Union Médicale*, May 18th) a case which he treated in an infant of only two months old, and he has collected and given an account of all the few cases of the disease occurring in nursing children which he has been able to find recorded.

OPHTHALMOLGY.

34. *On the Principles which should Guide us in Selecting an Operation in Cases of Senile Cataract.*—Dr. C. B. TAYLOR, in a paper read before the Surgical Section of the British Medical Association, remarked, that, "in selecting an operation in a given case of senile cataract, we must consider, first, which operation will secure the least number of lost eyes; and, second, how shall we at the same time insure the highest acuity of vision and the most perfect cosmetic result. The first consideration is undoubtedly paramount, but it is nevertheless impossible to ignore the second. The greatest average of success in complicated or difficult cases may be obtained by providing against disaster by the excision of a portion of iris, either as a preliminary or at the time of the operation; and in certain cases the cosmetic defect of a mutilated pupil may be avoided by making the incision upwards and limiting the iridectomy to the periphery of that membrane, leaving the pupil untouched and free in the anterior chamber, an operation which the author first introduced four years ago, when the Ophthalmological Congress was held in London; but by far the most beautiful and perfect results in favourable and average cases are secured by a form of incision which the author first practised in 1865, and illustrated by an engraving published in the *Edinburgh Medical Journal* in 1868. This operation is really a small flap, the base of which, instead of corresponding, as in Daviel's time-honoured operation, to the horizontal diameter of the cornea, occupies a position about midway between that line and the corneo-sclerotic junction, while its free edge lies in the vascular limbus corneæ; at first, this small flap was made upwards, but latterly, on account of the greater facility of the execution, the lower section has been adopted; any tendency to prolapse of the iris may be combated by the instillation of a solution of eserine immediately before commencing the operation. Iridectomy is undoubtedly a valuable resource, but it has its disadvantages, and is not necessary in a favourable or average case of extraction; if, however, the patient be suffering from marked senile marasmus, or, what is worse, from premature decay, if the cornea be thin, of small diameter, with thin glistening silky skin, or if the iris be much bruised during the operation, it is well to excise a portion of iris. Some patients who had undergone extraction and recovered with central and movable pupils were introduced; and the author mentioned that the sight was much more perfect in these cases than in those persons in whom it had been necessary to excise a portion of the iris; as a rule, but little after-treatment was necessary, and in one case the patient had only been confined for forty-eight hours, and went to church with eye uncovered in a bright sun the day week of the operation.—*British Medical Journal*, Aug. 26th, 1876.

35. *The Perception of Colour in Diseases of the Optic Nerve.*—E. Raehlmann publishes observations on this subject. He uses the spectrum, and either shows the patient all the colours at once, or isolates any particular colour by means of slits, and varies the illumination. He also tests whether the spectrum seems shortened at one end or not. If a patient can recognize all the colours of the spectrum, and the latter appears of its full length, there is no need to examine further. Different degrees of illumination, however, may be tried. If any defect is discovered, then careful observation is made as to whether different colours appear the same to the patient, yellow and green, for instance. This may occur even when all the colours of the spectrum have been told off in succession correctly. Another test is to show two colours recognized as distinct, and then leaving one colour (red, say) still visible, find at what part of the spectrum intervening a colour occurs which appears the same (as the red). Another test is to begin with a very feeble illumination, and gradually increase it till colour can be perceived. This amount of illumination may then be compared with that required by a normal eye. The author tests the periphery of the retina by selected pigment colours under a uniform illumination. The perception of colour, in affections of the optic nerve, closely resembles that of the periphery of the normal eye. When the defect is extreme, two colours only are perceived, and the greatest sensitiveness remains for yellow. He considers that a certain deficient sensitiveness for colour is pathognomonic of atrophy of the disk, and of the latter there are two forms. In the marked atrophy, with well-defined disk, there is always a deficient perception, but in the form dependent on choroidal peripheral retinal changes, it does not always occur. In retinitis pigmentosa he has never met with deficient perception of colour. In amblyopic conditions, attributed to alcohol and tobacco, he has not found deficient perception till atrophy ensued. Yellow and green are generally the first to be confounded. Commonly green is said to be white. With a strong light, two colours may be perceived, generally yellow and blue, and with a moderated light, three may be recognized, red, yellow or green, and blue. In a feeble light no colours at all. When colours are tried separately, red, yellow and green, and blue and violet may be confused. In very advanced atrophy, the whole spectrum may simply be seen as a bright light. He narrates various cases which he could watch for some time, and records in detail his observations.—*Royal Lond. Hospital Reports*, May, 1876, from *Graefe's Archiv.* Bd. xxi., Abth. 2, pp. 27-66.)

[The above statements of Raehlmann confirm the conclusions of the senior editor of this Journal, drawn from his own observations, and a comparison of many observations of others in regard to the perception of colours, which are that when there is the ability to distinguish only one colour, that colour is always yellow; when only two, these are yellow and blue. See No. of this Journal for Aug. 1840; also his edition of Lawrence on the Eye, Philadelphia, 1854, pp. 637-648.—Ed.]

36. *Congenital Malposition of the Lens in both Eyes.*—Mr. J. F. Streatfeild reports (*Royal Lond. Ophth. Hosp. Report*, May, 1876) a case of this in a girl nine years of age. Both lenses were displaced upwards. Mr. S. did iridectomy in each eye, excising symmetrically downwards a small section of the iris, not quite up to its greater circumference. The sight, with the aid of convex glasses, was very much improved.

MIDWIFERY AND GYNÆCOLOGY.

37. *Hot Water Injections in Uterine Hemorrhage.*—Dr. Windelband, at a meeting of the Berlin Medical Society, read a paper bearing the above title, descriptive of a practice which, paradoxical as it may appear, he regards as one of great importance and efficacy. His attention was first drawn to the

subject on perusing an account extracted from an American journal, in which Dr. Mann described the great benefit he had derived from hot-water injections in two cases of abortion—the pains, which had abated, being again aroused, and the hemorrhage ceasing. Called himself soon after to a case of abortion at three months, in which plugging, ice, ergot, etc., had in vain been tried to induce pains and check hemorrhage, he found the cervix uteri much relaxed, and the patient almost in a state of collapse. He resolved to try the injections, and, having introduced the uterine tube of a syringe within the cervix, threw in water at a temperature of 38° or 39° Réaumur (118° to 120° Fahr.). Immediately the hot water gained admission, the cervix began to contract and uterine pains were aroused, and by the time that eight or ten injections had been made, at intervals of five or ten minutes, the whole contents of the uterus had been expelled and the hemorrhage completely arrested. Encouraged by such success, Dr. Windleband has pursued the same practice in all subsequent abortions of a similar character; and, indeed, in all cases of hemorrhage connected with uterine relaxation, at whatever period this occurred, as also for the relief of spasmodic pains, and for the excitation of pains when too feeble, he has always availed himself of this stimulant, and has never found any disadvantage result from the practice. He relates two cases of placenta prævia in which the hemorrhage was permanently arrested.

Dr. Windleband stated that he only brought these few cases before the Society as specimens, assuring it that he had also met with a great number of abortions and deliveries (the latter less numerous than the former) in which severe hemorrhage was present, in the relief of which he had almost exclusively relied upon this means, without being disappointed, and without having witnessed any subsequent ill effects resulting from it. In cases in which hemorrhage has resulted from other causes, such as changed position of the organ, chronic inflammation, or uterine fibroma, palliative treatment by this means has proved of great value. He cites the case of a lady, the subject of two intramural uterine fibroids, in whom sudden excitement, mental disturbance, etc., brought on violent attacks of hemorrhage, by which, owing to the distance at which she lived from medical aid, she was often placed in a dangerous position. But, having the means at hand of using these hot-water injections, she found herself in comparative safety, and could even venture upon long journeys, while formerly she hardly ever dared to leave home. A two years' experience in treating the most varied and violent forms of uterine hemorrhage has amply proved that in these injections we have a most invaluable and certain means of dealing with these dangerous cases, which is much to be preferred to the employment of cold, astringents, etc., when prompt treatment is required. Plugging during the above period has only been resorted to when, from the suddenness of the occurrence of hemorrhage, a syringe or suitable apparatus has not been at hand. As far as a limited number of trials show, it seems also that the injections may be used in various conditions of the uterus which, independently of the existence of hemorrhage, call for a local stimulating treatment.

As to the mode of procedure, the injections have always been administered by means of a simple irrigator (the patient lying on her back), which enables a continuous and energetic stream to be propelled, the temperature of the water employed commencing at 38° R. (118° Fahr.), and increasing to 41° R. (124° Fahr.), the sensibility of the organs soon adapting themselves to the increased temperature. Not only are the effects soon produced, but they are unaccompanied by any of the unpleasant sensations and the various serious inconveniences that the application of cold so often gives rise to. While the warm injections are agreeable to the feelings of patients, however varying their susceptibility to pain may be, they never induce painful or mischievous reaction.

Dr. Windeband, in conclusion, observes that if it be objected that these results derivable from the warm injections are not in harmony with the well-known effects of warmth in producing relaxation of tissues and dilatation of vessels, attention should be directed to the fact that it is not warmth that is thus applied, but heat, and that we have to do with a contractile organ of very easy excitability. In fact, this heat arrests hemorrhage by stimulating the

muscular fibres of the uterus, just in the same manner as the application of cold does so. The enormous contractile action induced by the injections may be judged of, by placing the finger within the cervix while they are being administered. That they induce any direct coagulating power upon the bleeding vessels, is not to be supposed, as no signs of such power have been observed, and the temperature employed is insufficient for that purpose.—*Med. Times and Gaz.*, Aug. 5, 1876, from *Deutsche Med. Woch.*, June 17.

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38. *Hydrate of Chloral in Puerperal Convulsions.*—Dr. Chouppe, having had the opportunity of observing carefully a considerable number of cases of puerperal convulsions, has come to the conclusion that, of all the means we possess, the hydrate is the most reliable for treating this disease. In twelve cases in which it was alone employed the termination was successful, although in some of these the state of things seemed desperate when it was commenced. He thinks, indeed, that it should be resorted to even before the disease becomes confirmed, whenever the woman, exhibiting albuminuria and œdema, complains of headache, singing in the ears, hallucinations of vision, restlessness, cramps or vague pains in the limbs, etc. When there is trismus present it should be given in enemata, which have also the great advantage of being able to be given during the paroxysm. The doses will vary according to the tolerance of the patients and the severity of the paroxysms, but it is necessary to commence with a pretty strong one (especially if the paroxysms are violent and close upon each other), in order to make a powerful and quick impression. After a calm has been obtained, and if the attacks do not recur, some smaller doses may be given during the next twenty-four hours or so; but if the attacks recur, large doses must again be resorted to until the paroxysms have completely ceased. In an enema we may always begin with thirty grains, repeating this at the end of ten minutes; and by the mouth at least forty-five grains should be given at once, fifteen grains being repeated every quarter of an hour. In a violent attack the dose required will vary from 120 to 180 grains; and it may even be requisite to resort to hypodermic or intravenous injection. In all cases it is of importance to get at least sixty grains rapidly taken, and to prolong the use of the chloral for a tolerably long time after the cessation of the convulsions.—*Med. Times and Gaz.*, Aug. 26, from *Gazette Med.*, Aug. 5, 1876.

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39. *Puerperal Fever.*—Mr. R. Park has given (*Glasgow Medical Journal*, July, 1876) his recent experience of puerperal fever. He gives the details of six cases, and makes the following remarks: "I think no one will venture to call in question the assertion that Case I. was autogenetic, and that the predisposing cause was mental depression, and the exciting one her having sat up in bed and wearied herself trying to get her baby to take the breast.

"I can throw no light on the causation of the second case, it having occurred in the practice of another. However, it had all the appearance of a case that would be eminently contagious, and yet I attended eight cases before attending the third case, *all of whom did well.*

"Nearly seven weeks had elapsed since my attendance on No. II. when I delivered No. III. It is hardly possible I could have been the medium of infection here, if infection there was. Of all the eight patients above alluded to, none were *à priori* less likely to be recipients of a puerperal poison than this smart little woman. Besides it was, to all intents, a different *kind* of fever. In No. II. the fever was the essential disease, the peritonitis, etc., being complications; in No. III. the peritonitis was the essential complaint throughout, the fever being symptomatic. Her connection with scarlet fever is significant, but I cannot persuade myself that this was the cause of her trouble. I incline to the belief that her illness was like that of No. I., entirely autogenetic, the predisposing cause having been mental, and the exciting cause not obvious.

"Whilst attending Mrs. C., I also attended Mrs. C. A. She was a primipara, æt. 30, strong and vigorous. Both husband and wife were very anxious about the issue of the case, and so, against my will, I had to remain a long time with her, wearing the same garments I wore when attending Mrs. C. (I would be about thirty-six hours in pretty close attendance), and finally had to

use long forceps. She made an excellent recovery. It is manifest from this, either that the fever from which Mrs. C. suffered and died was not communicable, or else Mrs. C. A. was not inoculable. During October I also attended six other cases, all of which did well.

"On November 15, or exactly a month after Mrs. C.'s death, I attended Mrs. L. Her case has often caused me to make the mental inquiry whether some cases of puerperal fever may not antedate the birth of the fœtus. I am firmly persuaded in my own mind that hers was an autogenetic fever, and that she was ill previous to her delivery and before I first saw her. In her case I only made one vaginal examination, which was two days before her delivery, and consequently before the vaginal surface could have been abraded and absorption made easy. After labour, very little manipulation sufficed to bring away the after-birth, and supposing myself to have been at the time infection-laden, it is not readily conceivable how I could have communicated it here. But, *can I have been infection-laden, and yet able to attend Mrs. O., the very next day after Mrs. L.'s confinement, and yet not convey it to her?*

"Mrs. C.'s case (No. V.) was the most nearly consecutive of any of the series, and but for Mrs. O.'s intervening, I should have had very little hesitation in believing that I was the infection carrier. The occurrence of this case, however, renders it at least doubtful. I incline to the opinion that it was another instance of autogenesis—the act of giving birth being probably the last of a series of causes tending to upset the standard of health, and most likely, of these, actual contact with scarlet fever was not the least. Since Mrs. F.'s case (No. VI.) I have only attended one case, which was on February 11th—a fronto-pubic presentation—requiring the use of long forceps. She made an excellent recovery.

"No one who knows anything of the literature of puerperal fever, or who has had much experience of it in practice, would venture to assert that medical men have never been the means of conveying the disease to their patients. On the contrary, there is ample evidence on record tending to support the opposite position, and most of us are aware of instances in which it has occurred. Nevertheless, I think our views upon the subject have been and are too narrow and dogmatic. It has been proved that the fever may be autogenetic. My first case would prove it, supposing there was not another on record. This being established, then, it is quite possible that a number of cases—autogenetic—may occur in any practice within a limited period; and the assertion that all the cases following the first were due to conveyance of contagion by the medical attendant, should not be made without the most complete proof that such was the case in the individual instance. I contend that of this proof *consecutiveness of cases* should be the most essential element. For I believe we have not to encounter here a difficulty which faces us in dealing with the etiology of other fevers, viz., the question of greater or less predisposition to the fever. Let it be granted that an accoucheur is infection-laden, it matters not from what source, then *all* parturient women are liable, and equally so, to absorb the poison from him. I maintain it would be quite impossible for an infection-laden practitioner to attend a case to-day which should do well, and another which should die, and a third to-morrow who should do well.

"The question whether puerperal fever, when it has once been engendered, is *always* infectious or contagious, is also raised by my 'experience.' It is a very difficult one to answer, owing to the precautions in the way of disinfection invariably adopted. The only case of my six which, if I may be excused the expression, *looked* infectious, was that of Mrs. H. (No. II.), which answered to Ramsbotham's description of puerperal typhus, and yet I am not aware that any case became infected through it, although the practitioner in whose practice it occurred has a large midwifery practice amongst the lower classes in the town.

"The question of quarantine is the necessary complement of the other questions relating to puerperal fever. The element of disinfection comes in here again, and renders it difficult to estimate the *length of time* required to get rid of infection. So far as my 'experience' goes, and supposing, for the sake of argument, that I was infection-laden during the whole of the autumn months

after attendance on Case II., then it will be evident that, *even with the aid of disinfectants*, 85 days (July 7th to September 30th), are insufficient to get rid of the poison. The periods between the other cases were respectively four weeks, eight days, 6 weeks.

"It may be remaked here that I had on the same coat—a loose jacket—at all the confinements except the first. The disinfectant was Condy's fluid, which was used on all occasions, both to wash out the vagina of the patient and for my own hands before leaving the house. Then I am in the habit of taking a Turkish bath every two or three weeks, which I regard as the best of all personal disinfectants.

"It is a striking fact that in all the cases, except Nos. II. and VI., the lochia were normal, so far as order and quantity was concerned. Regarding the lochia in No. II., I did not investigate personally, as the case was hopeless ere I saw it. In No. VI. they were most offensive, however, and the odour of them attracted my attention before any other symptom. Yet the patient recovered."

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40. *Sacciform Development of the Posterior Uterine Wall during Pregnancy.*—In the *Archives de Tocologie* Prof. Depaul discusses a condition which he believes to have been hitherto incompletely described, or to have been mistaken for the result of complete or partial retroversion of the uterus during the earlier months of pregnancy. He first relates two cases which have come under his own observation, the first of which he saw in 1857 in conjunction with M. Parise. The patient was married at the age of eighteen, became pregnant after fifteen months, and was delivered naturally in 1852. In 1855 an abortion took place during the third month of pregnancy. After this she became pregnant again, and her confinement was expected about June 25th, 1857. She was then twenty-five years old. Some pains came on on June 25th, but subsided, and did not recur till July 28th. Considerable hemorrhage then took place, but ceased after some hours. After three days it recurred, and continued until August 3d. The pelvis was then found to be filled by a hemispherical tumour, in which M. Parise could distinguish the tubera ischii of the fœtus through the wall which covered them. The os uteri could be reached, high up behind the pubes, and appeared to be dilatable. The patient was treated by warm baths up to August 7th, by which time the fœtal movements had ceased. The patient then passed into a state of fever, after a rigor lasting two hours. M. Parise then introduced his whole hand, and felt what he believed to be the upper edge of a vertical septum, 20 cm. high, over which the fœtus was doubled up. He attempted to seize a foot, but in vain. Prof. Depaul was called in on August 10th, fourteen days after the commencement of labour, at which time there was a fetid discharge from the vagina. He then found that the cervix was not obliterated, and that the supposed septum was simply formed by the rigid and tendon-like crescentic lower margin of the internal os. He made slight incisions in this hard edge by means of a sickle-shaped bistoury in several places, and was then able to seize a foot, and extract a decomposed fœtus of more than normal size. The tumour which filled the vagina was an infundibulum, formed, as Prof. Depaul thinks, by undue development of one part of the uterine wall. He believes that the rigidity of the internal os was due to irritation caused by the fœtus being driven down into the infundibulum by the uterine action. The mother recovered well. M. Parise has published this case as being one of utero-interstitial pregnancy. Prof. Depaul thinks this an erroneous view, since the patient was quite well during her pregnancy, a state of things very different from that which occurs in tubo-uterine pregnancy.

In the second case, notwithstanding the lesson taught by the first, Prof. Depaul mistook the condition, as others have done, for one of complete obliteration of the os uteri. The patient, aged thirty-five, had had one miscarriage at about the second month, without any apparent cause. Labour came on on April 29th, 1875, when she was 7½ months pregnant. When she was seen by Prof. Depaul vigorous pains had continued for thirty hours, and the pulse was 106. There was some œdema of labia and lower extremities. The uterus

reached four finger-breadths above the umbilicus; its walls seemed to be thin and unusually tense. The quantity of liquor amnii appeared to be great, and vigorous fœtal movements were felt. The vagina was filled by a tense tumour, formed by part of the uterus, and reaching nearly to the vulva. The posterior cul-de-sac was obliterated. Anteriorly, Prof. Depaul believed that his finger reached, with difficulty, a cul-de-sac, without feeling any os or cervix. The vagina seemed dry, and it could not be ascertained that there was any uterine discharge, although the patient gave a doubtful account of the escape of some watery fluid the day before. A slight depression existed in the centre of the tumour, which confirmed the diagnosis that the case was one of obliteration of the os. A transverse incision was therefore made in the situation of the supposed os. Alarming hemorrhage followed, and when the finger was introduced, a spongy mass of placenta was felt. It was then supposed that the case was complicated by placenta prævia, and the vagina was plugged till the next morning. The plug was then removed without the occurrence of further hemorrhage, and some liquor amnii was allowed to escape by passing a sound through the placenta. In the evening no further change had taken place, and the patient was becoming exhausted. Prof. Depaul then introduced a pair of forceps, by which he gave exit to the rest of the liquor amnii, and removed in fragments the placenta which presented. He then, after much difficulty, brought down a leg by means of a blunt hook. By powerful traction the trunk was then extracted, but the head separated from it, and remained behind in the uterus. After attempting for three-quarters of an hour to obtain a firm hold of the head by craniotomy forceps or crochet, Prof. Depaul thought it better to suspend his efforts, and the patient died at 4.30 A.M. *Post-mortem:* The os uteri was found to be in front, above the upper margin of the pubes, and having a diameter of 3 cm. (1.2 inches). Its distance from the artificial opening in the axis of the uterus was 9 cm. (3.6 inches). The whole of the uterus formed a regular ovoid, but the development of its posterior wall had been relatively so much greater that the anterior wall had a meridian length of only 21 cm. (8.3 inches), while that of the posterior wall was 46 cm. (18.1 inches).

Prof. Depaul then reviewed a number of instances recorded in which a similar condition was found at the onset of labour, most of which were regarded by the authors who relate them as due to a posterior obliquity of the uterus, continuing up to full term, or as the result of a more complete retroversion in the earlier months of pregnancy. Franke, however, who records a case of the kind, regards it as being the result of a sacciform dilatation of the posterior uterine wall, perhaps combined with a partial retroversion of the uterus at term, in reference to the axis of the pelvic inlet. Special reference is made to the view of Dr. Barnes, who, in his Lectures on Obstetric Operations, explains the condition as due to excessive development of the *anterior* uterine wall, consequent upon complete retroversion during the earlier months of pregnancy, but does not support his opinion by any case in which an autopsy was made, so that the mode of development of the uterus could be ascertained from the position of the broad ligaments.

Prof. Depaul believes that the growth of different parts of the uterine wall is often very unequal, and from the condition found at the autopsy in his second case he draws the conclusion that the displacement of the os forwards and upwards is due to excessive development of the *posterior* uterine wall, the result of which is eventually to form an infundibulum at the lower end of the uterine ovoid.—*Obstetrical Journal of Great Britain and Ireland*, Aug. 1876.

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41. *Dilatation of the Uterus.*—Dr. LOMBE ATTHILL, in his address before the Section of Obstetrics of the British Medical Association, remarks: "I am well aware that by some practitioners the dilatation of the uterus is still looked on with dread, and that the attempt, if made at all, is undertaken with the greatest hesitation. I can only say that I believe these fears to be groundless, and that, if due care be taken to select suitable cases, and proper methods of carrying out the process be adopted, the treatment is a safe as well as a justifiable one. My own experience in the dilatation of the uterus has been great. I have practised it very frequently indeed during the last ten years, and as yet in no single

instance has a bad symptom followed, nor have I even once been compelled to abandon the attempt. But I am far from throwing doubt on the accuracy of the statements made by others, who have recorded the occurrence of alarming symptoms, or even of death, as consequent on the attempt to dilate the cervix uteri; and I am quite prepared for the possible occurrence of such, for all are aware that cases must occur in which the most trifling exciting cause will be followed by serious symptoms, though no grounds existed beforehand for anticipating the occurrence of such. But these are exceptional, and I believe, as a rule, that when serious symptoms arise, either during the process or in consequence of dilatation of the cervix uteri, they do so either because an unsuitable subject has been selected in whom to practise the treatment, or an unwise method adopted for carrying it out. On examining the records of the cases in which serious or unpleasant symptoms followed the attempt to dilate the uterus, I find they have generally occurred when practised—

"1st. Either for the relief of dysmenorrhœa depending on the existence of a narrow cervical canal;

"2d. When the cervical canal is encroached on by a fibroid of large size and unyielding structure;

"3d. When the process has been attempted to be carried out rapidly by means of metallic dilators, or,

"4th. When it has been protracted over several days.

"I have therefore, in order to guard as far as possible against the serious results recorded by others as following attempts to dilate the uterus, laid down for myself the following rules, which I can recommend with confidence to others.

"1. Never to dilate the cervix uteri for the cure of dysmenorrhœa or sterility depending on a narrow cervical canal or conical cervix.

"2. Never to dilate in cases in which a large and dense intra-mural fibroid presses on and partially obliterates the cervical canal.

"3. Never to use metallic dilators of any kind, but to choose for the purpose either sponge or sea-tangle-tents, which expand slowly and gradually.

"4. Never to continue the process of dilatation for more than forty-eight hours. I prefer, in the few cases I have met with in which, after the lapse of that time, the cervix was not sufficiently opened to suit the purposes I had in view, to postpone all operative interference for some weeks, rather than risk the result by prolonging the dilating process.

"With respect to the first of these rules, I look upon the treatment of what is termed 'mechanical dysmenorrhœa' by dilatation as being altogether a mistake. I doubt if any permanent benefit has ever resulted from it; while in several cases grave symptoms, and in one death, has to my knowledge followed the attempt. Equally, it is of importance not to prolong the dilating process. My own experience in the treatment of uterine disease requiring dilatation leads me to this conclusion, that unpleasant symptoms are likely to occur in a direct ratio to the length of time over which the process of dilatation extends. Again, I have known death to follow the attempt to dilate the uterus in a case where a large fibroid of dense structure, giving rise to menorrhagia, and causing intense pain, was developed in the uterus, and encroached on the cervical canal. In such cases, dilatation is doubly objectionable, because the process is useless as well as dangerous: useless, because you will generally find that any attempt at operative interference from the interior of the uterus will be impossible; and dangerous, because inflammation is liable to follow, and that too in patients in the worst possible condition for resisting the attack."—*Brit. Med. Journ.*, Aug. 12, 1876.

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42. *Uterine Fibroids.*—"In the treatment of uterine fibroids," Dr. Lombe Atthill remarks, "we have made progress, but not as yet to a satisfactory extent. This much we know for certain, that many such cases, if menorrhagia be not excessive or pain intense, are best left alone; and it is astonishing in how many instances, even where menstruation is profuse, this course proves to be a wise one, treatment being restricted merely to what is absolutely necessary to prevent the flow being excessive. But, unfortunately, exceptions are of but

too frequent occurrence; and how are we to treat these? The removal of large fibroids by abdominal section has been successfully practised, but the risk of life involved in the operation is great; and the attempt to remove smaller ones by means of the *écraseur*, after dilatation of the cervix, is, I can vouch from personal experience, a difficult and eminently hazardous process. Again, enucleation is tedious, unsatisfactory, and often dangerous.

We have, however, at our command a resource which, if not all that we desire, is still generally efficient in controlling hemorrhage, often sufficient to arrest the growth of the tumour, and sometimes apparently capable of reducing its size. I allude to the hypodermic injection of ergot, which, if it has failed in this country to produce the almost marvellous results ascribed to it by Hildebrand, is, if properly carried out, a safe as well as an efficient remedy. In my first cases, the results obtained were not only uncertain, but unsatisfactory, for troublesome sores sooner or later formed at the seat of the injection. Of late, however, I have obtained much better results. In not one of ten cases recently under my care, in which I fairly tested this treatment, has the hypodermic injection of ergot been followed by the formation of an abscess or sore; in all it had more or less effect in restraining hemorrhage: in one, the injection was repeated almost daily for five months, with the effect of absolutely restraining excessive menstruation, but with no other beneficial result, for the bulk of the tumour remained unaltered, and the pain was as intense as ever. Still it was no small matter to have transformed a profuse and exhausting flow, which formerly lasted for twelve or fourteen days, into one of moderate character and of but two or three days' duration. It is evident, then, that in ergot, employed hypodermically, we have a powerful agent, one capable of exerting a marked influence on uterine fibroids, but still uncertain in its action, and not altogether to be relied on.—Address before Obstetric Section Brit. Med. Assoc. *British Med. Journ.*, Aug. 12, 1876.

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43. *Pelvic Hæmatocele successfully treated by Drainage.*—Mr. J. K. THORNTON relates (*Med. Times and Gaz.*, June 10 and 17) two cases of this, and calls attention to the following points: "1. That it is advisable in some cases, when the effusion is so large or its situation such as to render the chance of spontaneous evacuation dangerous, to open pelvic hæmatocele, though no serious symptoms are present. 2. That free incision and drainage are preferable to puncture in all cases, when possible. 3. That it is not advisable to puncture per rectum, unless compelled to do so by the relations of the effusion. 4. That it is not advisable to use injections in early stages after opening."

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44. *Certain forms of Ovarian Disease.*—"Information is specially needed," Dr. ATTHILL remarks (Address before Obstetrical Section Brit. Med. Assoc.), "with respect to some forms of ovarian disease. Some patients suffer for years from pain and tenderness of the ovary, from mammary pain and nausea of a most distressing character. Such I have seen reduced to a condition of actual despair; for all treatment seems useless, so utterly inefficient does it prove. In these cases, the ovaries are in general plainly enlarged, but the exact pathological condition of them is in many cases unknown. Here is an affection most deserving of investigation, both as to its causation, pathology, and treatment. I know of no form of disease which produces more real suffering, equally of mind and body. An American surgeon, Dr. Battey of Georgia, convinced of the inadequate results produced by ordinary treatment, has recommended the extirpation of the ovaries in such cases, arguing that, from the results on animals, the operation would be safe as well as justifiable in the human female. I confess that to my mind his views contain much of truth, and that, were I satisfied that I did not endanger life, I would in some cases sanction the operation; and I think we may possibly yet see it practised even amongst ourselves, as I believe it has been in America. But such a practice would, after all, be a lamentable confession of the inadequacy of medicine to cope with what should be a curable disease. Let us hope that, as light is let in on these obscure questions, this reproach will be removed."—*Brit. Med. Journ.*, Aug. 12, 1876.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Subperiosteal Abscess with Hyperostosis of Femur; Extensive Burrowing of Pus; Chronic Pyemia; Recovery. By Wm. M. FINDLEY, M.D., of Altoona, Pennsylvania.

W. A. P., æt. 34, of a scrofulous or tuberculous tendency, was attacked with severe deep-seated pain on inner side of right thigh, along the attachments of the adductors; supposed to have been produced by resting the weight of a piano there in moving it from one place to another. Was treated for rheumatism, etc.; leg enlarged symmetrically from knee to hip, having its starting-point about the middle of the limb however. The limb was not examined, but after a period of eight or ten weeks, in consultation, a small puncture was made from which large quantities of pus escaped. About this time there was pus passing from the bowels and bladder, it is asserted; moreover, pus burrowed down behind the femur, through the foramen in the adductor magnus for the femoral vessels, and passing to the outer side of the leg, broke through the inter-muscular space, and discharged externally. By this circuitous route, the contents were evacuated for some time. The femur became enlarged and painful. About eight months after this time he came under my care, when a free incision between the vastus externus and the long head of the biceps, with another on the inner aspect of the thigh through the vastus internus and crureus, exposed the track of a sinus and sac some twelve or eighteen inches long, extending from the capsular ligament of the head of the femur, to the investing ligaments of the knee-joint. Packing, free use of salicylic and carbolic acids, and permanganate of potassa as injections, the liberal use of quinia and cod-liver oil, and a generous diet, soon restored one who had that waxy, sallow, pyemic look, so common to those suffering from chronic bone disease, to a healthy man as far as present appearances go.

At the present time, one year after he recovered and passed from under my care, W. A. P. is enjoying most excellent health; leg perfectly sound, and he is walking from five to ten miles per day on it without the least inconvenience; he has lost all symptoms of lung complication, from which he was suffering then from the effort to throw off the pyemic secretion.

DOMESTIC SUMMARY.

Thoracentesis.—Prof. S. C. CHEW, of the University, Maryland, discusses (*New York Med. Journ.*, Sept., 1876) the following questions: "When a pleurisy is encountered in which effusion has taken place to such extent as to cause dullness and absence of respiratory murmur over the greater part or the whole of one side of the chest, is medical treatment to be discarded and the assistance of surgery invoked? Should the presence of fluid in large amount be

considered as *ipso facto* and independently of accompanying circumstances an indication for surgical interference; or is it possible to obtain in this stage, from medical means in the strict sense, better results than those promised by surgery? Are we to regard the operation of paracentesis of the thorax as in all cases justifiable and advisable when the effusion has reached any considerable amount; or is it to be resorted to only in certain special conditions, the larger proportion of cases being best dealt with by medical means?"

He considers that there are the three following classes of cases in which the question of pneumatic aspiration of the thorax must be entertained:—

"1. The first consists of those cases in which a large pleuritic effusion has suddenly occurred, and has overwhelmed the function of one lung before there has been time for the supplementary action of the other to be brought fully into play; or again, where hydrothorax, as distinguished from pleuritic effusion, has occupied both sides of the chest in such amount that respiration is dangerously embarrassed. In this class of cases the aspirator must be immediately used, because there is no time for medical means to act, and we are to be guided not by the auscultatory signs alone, but by the clinical conditions of the case.

"2. The second class is composed of cases in which, judging from the physical signs alone, we might be tempted to use the aspirator, and are certainly bound to examine carefully whether the conditions requiring its use actually exist, but in which the clinical state is found on such examination not to demand immediate interference with surgery. For respiration may not be seriously embarrassed, even though the effusion be very large; the rapidity with which it has occurred being a more important factor in the production of dyspnœa than the amount. In these cases, if the condition has not continued long, it is best to use medical means, of which the most efficient are the tincture of the chloride and the syrup of the iodide of iron in doses of from half a drachm to a drachm; and, notwithstanding that their efficacy is denied by some distinguished authorities, I make bold to urge the repeated application of fly-blisters. These agents are, I am sure, of great value; whether they act by a direct stimulant influence upon the absorbents, or by merely removing serum from the capillaries of the chest-wall, and thus rendering them better instruments for absorption, or yet, again, by an action on the vaso-motor nerves, are questions of interest, it is true, but of secondary importance to the general one as to whether they do good clinically; and, that they do, I am fully convinced. For, though I have used them always of late years in conjunction with iron, yet I have seen the line of dulness fall so rapidly under this treatment as to feel sure the change was due more to the blistering than to the small amount of iron as yet taken. Yet the ferruginous medicines perform an important part by increasing the solid elements of the blood, and thus lessening the tendency to transudation, while, in virtue of their diuretic action, they help to remove what has already accumulated.

"3. The third class of cases consists of those in which, as in the first class, thoracentesis is plainly required as the only means likely to afford relief. Into this category some cases belonging to the second class just spoken of may pass; cases, that is, in which although at first there may have been a well-founded belief or hope that they would recover under medical treatment, yet either this hope has been proved by time to be fallacious, or the cases when first seen by the physician have manifestly passed beyond the period within which it would be worth while to wait longer for the action of medicine. For here there may be risk of ultimate danger accruing to the lung through long-continued pressure causing carnification. In this third division I would place also those cases in which there is good reason to believe that the effusion is purulent; hence the importance of being able to decide this question with certainty; for, the purulent nature of the fluid once determined, it is useless to continue medication with a view to its removal. Nothing remains but mechanical evacuation. In any case where the fluid is suspected to be pus, an exploratory puncture may be made with a fine aspirating needle, which may thus be a diagnostic as well as a therapeutic means."

The several conditions which Prof. C. would group together in the third class as clearly requiring the use of the aspirator, are—

"1. Where the purulent character of the effusion is indicated with certainty or with high probability.

"2. Where an effusion reaching half-way up one side of the thorax is undiminished by medical treatment persistently applied for three or four weeks; and, *à fortiori*, if it have increased in spite of such treatment.

"3. Where, with a large effusion, previously not alarming in character, sudden and urgent dyspnœa has occurred. Lives have, no doubt, often been lost from the operation having been delayed or not performed in such conditions; but, with its use, under the most threatening circumstances, prompt relief and deliverance have many times been given."

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Transfusion of Blood in the Last Stages of Phthisis.—Dr. Jos. W. Howe records (*Archives of Clin. Surg.*, July, 1876) three cases in which he performed this operation. The conclusions which he draws from these cases are—

"*First.*—The operation of transfusion in phthisis is peculiarly dangerous, because with a weakened heart there is obstruction to the circulation in the lungs, and deficient aeration of the blood, which both tend to overcome the heart's action and produce syncope.

"*Second.*—The introduction of healthy blood temporarily improves the condition of the patient, in much the same manner that alcohol and quinine do when taken into the system.

"*Third.*—The transfusion of blood in advanced phthisis is scarcely a justifiable operation, because the temporary benefit obtained does not by any means compensate for the risk of the operation."

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The Crepitant Râle; its Nature and Conditions of Production.—Dr. W. H. Workman, of Worcester, endeavours to establish (*Boston Med. and Surg. Journ.*, Aug. 3, 1876) the following points in regard to this subject: The crepitant râle has its seat in the alveoli and infundibula, and possibly also in the ultimate bronchioles, the walls of which have the same structure as those of the air-vesicles. It does not occur in the diseased parts, but in those immediately around remaining nearly or quite healthy. Its origin is purely physical, and is due, first, to compression from without, and, secondly, to expansion from within. The compression is produced by adjacent indurations resulting from disease. It makes no difference what the pathological process may be, provided an induration be formed in or at the surface of the lung in such a manner as to give rise to the two above-named conditions in a spot favourable to perception by the ear. Hence, the crepitant râle is peculiar to no one disease, as was formerly supposed, but may exist in several, each having its distinct pathological nature.

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The Chemical detection of Lead and Iron Bullets in Gunshot Wounds.—J. R. Uhler, M.D., communicated to the Maryland Academy of Sciences, a method for the more certain detection of leaden and iron bullets when imbedded in the tissues, as in gunshot and shell injuries, especially where they have taken an obscure or curved course, and cannot be readily felt by finger or probe, which appears to be very ingenious.

"The plan he stated was suggested in 1863 by noticing a case in hospital where sulphuretted hydrogen from pus had blackened ordinary lead plaster, and after a little thought was tried and perfected on the spot. It consists of employing materials capable of dissolving lead or iron, such as very dilute nitric acid, and then testing the solution by the usual plan for those metals.

"The apparatus for its application and the method required are very simple, consisting of a syringe to thoroughly cleanse the wounds with pure water, after which a solution of nitric acid, 5 to 15 drops to a drachm of distilled water, is injected into the wound and allowed to remain a short time, to come in contact with and dissolve a portion of the ball. The injected fluid is then withdrawn either by syringe or changing the position of the patient so as to let it run out, and is received when possible at two places, upon a white porcelain plate. One of these spots is now to be tested by a small crystal or solution of iodide of potassium, which will produce a golden-yellow colour if lead be present. The

other may be treated by a solution of sulphocyanide of potassium, giving a beautiful red, or ferrocyanide of potassium affording blue if iron be there. Both of these methods are extremely delicate, and can only be obscured by neglect to wash away pus with accompanying chloride of sodium, or inexcusable carelessness causing loss of blood, and thus producing the reactions of iron from the small quantity contained in the blood-globules. To show most efficiently, the fluid on the plate ought to be colourless, or but slightly tinged like serum. The syringe should generally be introduced but a short distance into the wound, so as to give rise to as little irritation as possible, and the nitric acid solution for the same reason be very dilute. The whole procedure is less irritant than probing, and also extremely useful to the patient, as dilute nitric acid has long been esteemed one of our best dressings for hospital sores. Other solvents and tests might be employed, but the above are the handiest."

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Extirpation of the Uterus in connection with Ovariotomy—Recovery. Dr. GILMAN KIMBALL records (*Boston Med. and Surg. Journ.*, Aug. 31st), a case of this. The patient was 48 years old, and had been operated on eleven years before for a cystiform ovarian tumour, which after removal weighed thirty-three pounds. She made a good recovery, and continued in good health for six years, about which time she noticed her abdomen was enlarging. In June, 1875, she was tapped and forty-five pounds of brown coffee-coloured fluid drawn off, followed by extreme prostration. She was again tapped in October, and as these tappings only afforded temporary relief, and her health failing, she applied November 5th to Dr. Kimball to again operate. This was accordingly done the next morning in the following manner: "An opening through the parietes, in the line of the former incision, was followed by an escape of several ounces of ascitic fluid. A cyst was tapped by a large trocar, and twenty-seven pounds of chocolate-coloured fluid were drawn away through a canula, to which a rubber tube had been attached. The opening was enlarged and the cyst emptied. A semi-solid mass, composed chiefly of a large number of smaller cysts, was slowly drawn through the incision, care being taken all the while to keep the opening closed, as far as possible, against the ingress of atmospheric air.

"In searching for a pedicle it was found that the disease had embraced, in the course of its development, not only the uterus, but the whole of the left broad ligament. A separation of the parts thus involved was found impossible. Consequently, in order to complete the operation, the extirpation of the entire uterus became an unavoidable necessity. A cluster of distended veins connected with the broad ligament was first secured and severed between two ligatures. The remaining tissues to be divided, being thus considerably diminished in bulk, and especially in width, were next embraced in a loop of stout annealed iron wire, drawn tight by means of an écraseur. To complete the operation it only remained to sever the connection between the uterus and vagina by two or three strokes of the knife. The point of division was about three-fourths of an inch outside the iron ligature.

"Before closing the wound it was found necessary to remove a considerable quantity of coagulated blood from the pelvic cavity. With some difficulty and delay a bleeding vessel was finally discovered, and secured with a carbolized ligature.

"The pedicle, being too short to admit of a clamp, was drawn forward and secured between the lips of the incision. The surface of the stump was thoroughly seared by actual cautery, and the wound closed with four deep sutures, three above and one below the pedicle.

"Details of this case subsequent to the operation furnish nothing of special interest. During the entire period of convalescence there were no unpleasant symptoms; in all respects they were such as might be expected in an ordinarily favourable case of ovariotomy. From first to last there were no signs of peritonitis or septicæmia."

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Ovariotomy.—Dr. R. A. KINLOCH reports (*Charleston Medical Journal* July, 1876) two cases of ovariotomy, both successful. He remarks that "in the

above cases we have not only a test of the value of ligatures of different materials, but that these were employed after distinct methods. Carbolized catgut was used in the first operation, and the ends of the ligature cut off close to the loop, this being left to become encysted or undergo absorption. In the second operation, silk was the material employed. With the right pedicle the loop was left to be encysted. With the left, this was practised only with one half of the pedicle, the ligature of the other half being brought out of the wound.

"This application of distinct methods was not a matter of experiment merely. Originally, and as the result of a careful consideration of the experience of the best operators, I was inclined to the belief, that with silk, as well as catgut ligatures, it was best to leave the loop to take care of itself, *rather than risk keeping open the cavity*. Without wishing to generalize from a small experience, I am, nevertheless, now disposed to regard the so-called open treatment, or the use of the ligature after the original method of McDowell, as offering the best chance for success in certain grave cases of this operation.

"The ligature thus used, insures a certain degree of drainage. If made antiseptic, it can hardly act as a local irritant to tissues with which it remains in contact. It is, besides, incorrect to affirm that the ligature *keeps open* the peritoneal cavity. If it be properly managed, it takes a tolerably direct route from the pedicle and the Douglas *cul-de-sac*, outwards; and its presence, together with the necessary inflammatory or nutritive changes of the first forty-eight hours, establishes a track that is independent, and, as it were, *outside* of the general cavity. By means of this tubular wound then escape the materials, liquid or solid, the retention of which would seal the fate of the sufferer. By this channel also may we expect, by the aid of cleansing or antiseptic injections, to assist the natural efforts by which inflammatory products reach the surface.

"What is here attributed for the ligature, may with greater reason be assigned to the drainage tube. If the former has the advantage of occupying less space, the latter is certainly superior as a means of drainage, and as an efficient instrument wherewith to introduce our cleansing injections. The calibre of the tube allows solid particles, or effete products, to pass readily, gases to escape promptly, and, as we saw in the clinical history of our second case, even large pieces of gangrenous structure to be removed with ease. It is most certainly true that many cases of ovariotomy require no provision for drainage. But can these be invariably recognized? Does it not require an extensive experience in such operations to say when life is, or is not, to be threatened by the detention of exudations or inflammatory products? Is it not a safer rule to give all cases the benefit of a doubt when we have once ascertained that the use of a ligature, or of a tube, is generally well borne? . . . . I am firm in my conviction that the retention of the peritoneal serous exudation, that during the first twenty-four hours escaped through the tube in case No. 2, would have proved adverse to recovery. And what shall be said of the consequences that would have ensued had the portions of gangrenous tissue not found ready exit? It may be said by some that the presence of the tube developed such inflammatory products. I cannot admit such a conclusion in view of the abundant evidence given by Professors Peaslee, Thomas, and others, of the tube being generally well borne."

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Laceration of the Female Perineum.—Dr. D. M. Stimson records (*Archives of Clin. Surg.*, July, 1876) the following case of this in which he successfully operated by a procedure devised by Dr. Willard Parker, who has employed it in seven cases with perfect success.

"Mrs. V., æt. twenty-eight, during first labour had her perineum torn completely through into the bowel, the rent extending two and a half inches up the recto-vaginal septum. The labour was instrumental and exceedingly difficult, her pelvis being contracted at the sub-pubic arch. An operation was performed two months after the accident, but it was unsuccessful.

"On May 10, 1876, I operated upon her, assisted by Drs. Geo. A. Peters, and Willard Parker, Jr., Willard Parker, Sr., being also present. The patient, having been duly prepared for the operation by warm douches and attention to

diet and bowels, was etherized, placed in the position for lithotomy, and the parts were shaved. The sphincter ani was divided subcutaneously close to the coccyx on either side, and the muscle stretched. I then dissected, from below upwards, the cicatrices from the ruptured surfaces, leaving the flaps thus obtained attached to the vaginal surface; and split the edge of the recto-vaginal septum so that raw surfaces might be obtained without loss of substance. Next I made a slightly curved incision, three inches in length, parallel to and three-quarters of an inch from the edge of the wound on either side, and carried it deeply enough into the ischio-rectal fossa to enable me to press the deepest part of the fissure together, by my fingers passed to the bottom of these cuts.

"A doubled silver wire was then carried from the bottom of one of the side cuts through the angle of the wound at the split septum to the side cut opposite, and the ends secured around a piece of elastic catheter. The edges of the split septum were united by fine sutures both in the vagina and rectum; two more double wire sutures were placed in the wound and twisted over bits of catheter, one three-quarters of an inch nearer the surface than the first, and the third through the centre of the perineal mass. The cicatricial flaps were now trimmed and brought together so as to form a valve of protection from vaginal discharges, after the idea of Langenbeck. Fine sutures were used also in bringing together the mucous membrane of the rectum; and lastly, the more superficial parts of the perineum were united by the ordinary silk suture.

"The patient was now placed upon her back in bed, her thighs separated widely, and a single thickness of sheet made to be the only covering over their upper parts. A Jacque's gum-elastic catheter was passed into the bladder, with conducting rubber tube; and a dose of morphine administered. The deep sutures were removed on the fifth day. The bowels were moved by castor-oil and enema on the tenth day. The catheter was retained until the tenth day.

"I have to-day, May 30, examined the patient, and find the recto-vaginal septum complete, the perineum entirely restored, and the patient can control the sphincter perfectly unless the bowels are loose.

"The distinguishing features of this operation are: *First.*—That the deep sutures draw in a straight line and a more secure coaptation of surfaces is thereby obtained. *Secondly.*—The side cuts relieve traction by dividing the transverse perineal muscles as well as skin and fascia. *Thirdly.*—Air is admitted freely to the wound, and 'poulticing' to a certain degree prevented."

True Puerperal Diphtheria.—Dr. M. A. PALLEN communicated, March 21, to the New York Obstetrical Society a case of this occurring in a woman who had been two weeks before delivered of a healthy child with the forceps for inertia uteri. Mother and child did well, and were returned to the care of the attending physician. Dr. Pallen heard nothing from them them until this morning, when he was sent for to see the child. On his arrival he found it dead from diphtheria, which had been diagnosed only twenty-four hours before. The mother, who was up and had been nursing the child, apparently presented no other symptoms than a feverish, excited manner which was attributed to grief at the sudden loss of her child. This evening he was called again and found the woman moribund. Her whole vulva and the vagina, as far up as he could see through an ordinary bivalve speculum, were covered with diphtheritic membrane, the first appearance of which had been noticed at 11 A.M, soon after his morning visit.—*American Journ. Obstet.*, Aug., 1876.

International Medical Congress, Philadelphia, 1876.—The International Medical Congress was formally opened at noon on Monday, September 4, 1876, in the University of Pennsylvania, by Samuel D. Gross, M.D., LL.D., D.C.L. Oxon., President of the Centennial Medical Commission. A full abstract of the proceedings of the Congress has already been laid before our readers in the October issue of the *Medical News and Library*.

The Congress constituted the most distinguished medical gathering ever assembled on this Continent, and its proceedings, from a scientific as well as from every other point of view, characterized it as the most successful.

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